



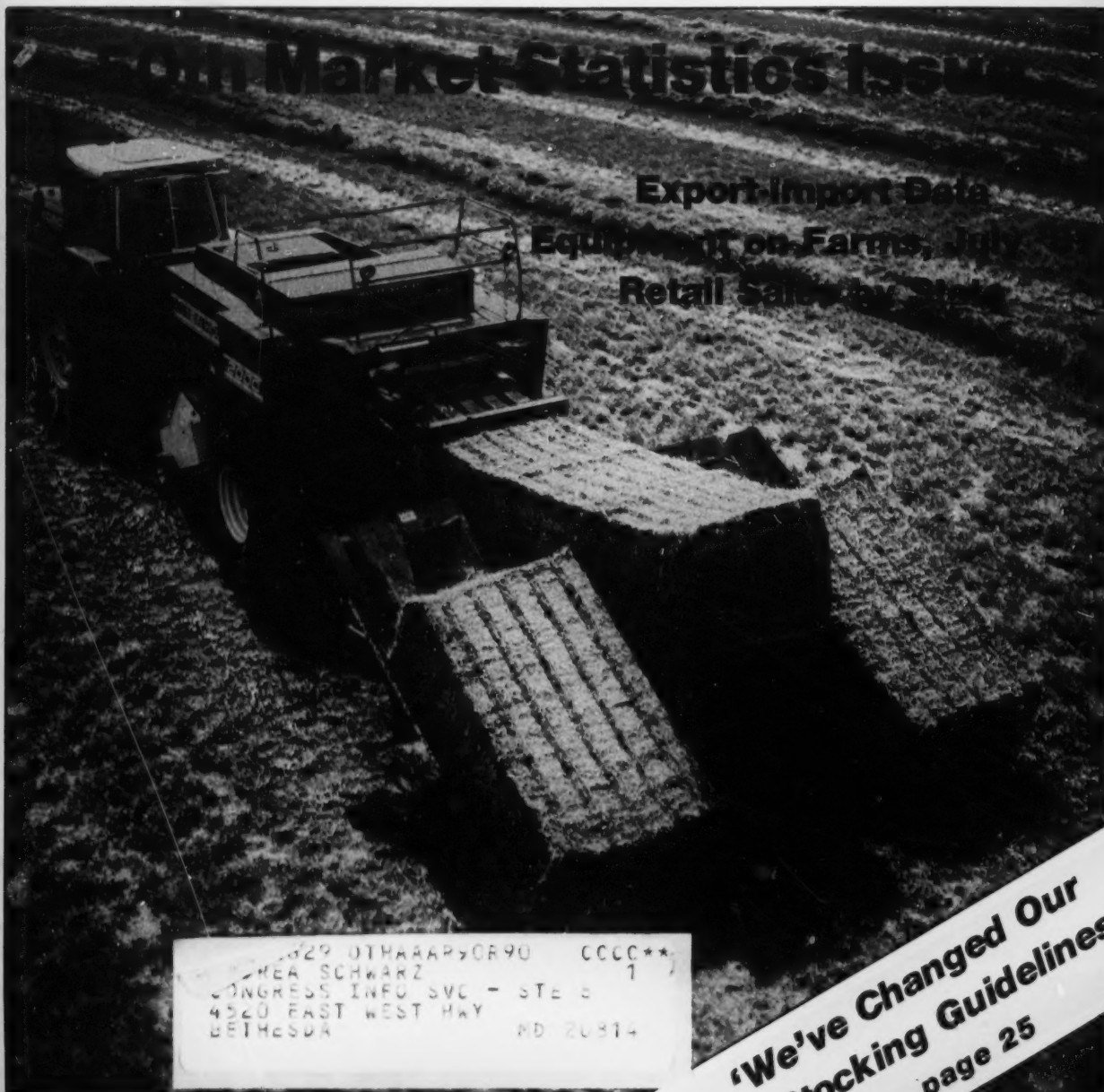
# Implement & Tractor

The business magazine of the farm and industrial equipment industry

October 1987

**Grounds Maintenance Market**

**page 23**



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**'We've Changed Our  
Stocking Guidelines'**  
page 25



# Implement & Tractor

The business magazine of the farm and industrial equipment industry.

October 1987 • Vol. 102 • No. 11

## Our Cover Story

*Implement & Tractor presents its 50th Market Statistics Issue—equipment inventories by state and type of product; retail sales by state; and import and export figures.*

**7-19**

On the cover: photo  
from Ford New Holland



## Features

- 20:** **Discouraging statistics** couldn't overshadow the good ideas exhibited at the 1987 Royal Show in Britain. Michael Williams reports and gives us a look at some of those ideas.
- 23:** **Outdoor power** equipment kept the doors of many dealerships open during recent years. Forecasts are that good opportunities for consumer and commercial sales will continue.
- 25:** **Having designated** the parts department as the profit center of his dealership, Texan Jerry James is making changes designed to improve the fill rate and inventory turns.
- 27:** **Ernest Chesney**, a north central Texas farmer and former implement dealer, advises those on both sides of the counter to improve their relationship as partners in agriculture.

## Departments

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**Farm Press  
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## Motor Vehicles and Specified Machines on U.S. Farms and Average Prices of Wheel Tractors, January 1, Designated Years<sup>1</sup>

| YEAR | TRACTORS<br>(exclusive<br>of steam &<br>garden) <sup>2</sup> | MOTOR<br>TRUCKS | GRAIN<br>COMBINES | CORN<br>PICKERS<br>and PICKER<br>SHELLERS | PICK-UP<br>BALERS | FIELD<br>FORAGE<br>HARVESTERS | GARDEN<br>TRACTORS<br>and MOTOR<br>TILLERS <sup>3</sup> | WHEEL TRACTORS<br>WHOLESALE PRICES <sup>4</sup> |                       |
|------|--------------------------------------------------------------|-----------------|-------------------|-------------------------------------------|-------------------|-------------------------------|---------------------------------------------------------|-------------------------------------------------|-----------------------|
|      | Thousands                                                    | Thousands       | Thousands         | Thousands                                 | Thousands         | Thousands                     | Thousands                                               | Per Unit<br>Dollars                             | Horsepower<br>Dollars |
| 1964 | 4,786                                                        | 2,970           | 920               | 705                                       | 734               | 312                           | 513                                                     | \$ 3,443                                        | \$ 53                 |
| 1965 | 4,787                                                        | 3,030           | 910               | 690                                       | 751               | 316                           | 699                                                     | \$ 3,541                                        | \$ 56                 |
| 1966 | 4,783                                                        | 3,017           | 888               | 686                                       | 752               | 316                           | 725                                                     | \$ 3,886                                        | \$ 58                 |
| 1967 | 4,786                                                        | 3,009           | 867               | 680                                       | 748               | 319                           | 750                                                     | \$ 4,257                                        | \$ 62                 |
| 1968 | 4,766                                                        | 3,016           | 847               | 673                                       | 739               | 321                           | 770                                                     | \$ 4,709                                        | \$ 66                 |
| 1969 | 4,712                                                        | 3,004           | 820               | 657                                       | 725               | 314                           | 790                                                     | \$ 4,976                                        | \$ 71                 |
| 1970 | 4,619                                                        | 2,978           | 790               | 635                                       | 708               | 304                           | 805                                                     | \$ 5,560                                        | \$ 76                 |
| 1971 | 4,562                                                        | 2,985           | 760               | 629                                       | 698               | 309                           | 815                                                     | \$ 6,190                                        | \$ 80                 |
| 1972 | 4,509                                                        | 2,993           | 725               | 625                                       | 687               | 315                           | 825                                                     | \$ 6,486                                        | \$ 84                 |
| 1973 | 4,477                                                        | 3,006           | 703               | 618                                       | 680               | 324                           | 835                                                     | \$ 6,953                                        | \$ 85                 |
| 1974 | 4,478                                                        | 3,020           | 685               | 618                                       | 677               | 332                           | 850                                                     | \$ 7,294                                        | \$ 86                 |
| 1975 | 4,463                                                        | 3,032           | 666               | 615                                       | 666               | 337                           | 870                                                     | \$ 8,459                                        | \$ 91                 |
| 1976 | 4,434                                                        | 3,043           | 647               | 610                                       | 642               | 342                           | 890                                                     | \$11,220                                        | \$112                 |
| 1977 | 4,381                                                        | 3,052           | 630               | 605                                       | 614               | 346                           | 905                                                     | \$12,692                                        | \$124                 |
| 1978 | 4,350                                                        | 3,054           | 615               | 600                                       | 595               | 345                           | 917                                                     | \$13,431                                        | \$144                 |
| 1979 | 4,623                                                        | 3,350           | 655               | 596                                       | 744               | 295                           | 927                                                     | \$16,512                                        | \$149                 |
| 1980 | 4,598                                                        | 3,367           | 653               | 592                                       | 759               | 293                           | 933                                                     | \$18,139                                        | \$166                 |
| 1981 | 4,573                                                        | 3,385           | 650               | 587                                       | 774               | 291                           | 938                                                     | \$23,308                                        | \$199                 |
| 1982 | 4,547                                                        | 3,405           | 647               | 582                                       | 788               | 288                           | 942                                                     | \$25,941                                        | \$204                 |
| 1983 | 4,520                                                        | 3,427           | 644               | 576                                       | 799               | 285                           | 944                                                     | \$34,198                                        | \$237                 |
| 1984 | 4,497                                                        | 3,449           | 642               | 569                                       | 810               | 282                           | 945                                                     | \$37,434                                        | \$261                 |
| 1985 | 4,480                                                        | 3,467           | 640               | 561                                       | 822               | 280                           | 942                                                     | \$40,730                                        | \$290                 |
| 1986 | 4,465                                                        | 3,460           | 637               | 552                                       | 819               | 278                           | 938                                                     | —                                               | —                     |
| 1987 | 4,443                                                        | 3,446           | 632               | 540                                       | 812               | 273                           | 933                                                     | —                                               | —                     |

<sup>1</sup>SOURCE: Reports of the USDA and the Bureau of the Census. On-farm data after 1970, except 1975 and 1979, are estimated by I&T.

<sup>2</sup>Consists of Wheel and Crawler Tractors.

<sup>3</sup>Motor Tillers included after 1964.

<sup>4</sup>Estimated at wholesale level by dividing Value of Manufacturers' Shipments by Units Shipped and by Maximum Belt Horsepower, data are published in "Current Industrial Reports" of the Bureau of the Census. Not available after 1985.

Note: Data from the 1978 Census (Jan. 1, 1979 above) and later years, reflect changes in sample coverage and are not fully comparable with earlier years.

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## Principal Machines on Farms — 1987

| STATE                       | MOTOR TRUCKS             |                          |                                        | INTERNAL COMBUSTION ENGINES <sup>1</sup> | CHAIN SAWS                          |
|-----------------------------|--------------------------|--------------------------|----------------------------------------|------------------------------------------|-------------------------------------|
|                             | 1978 Census<br>Thousands | 1982 Census<br>Thousands | Estimated<br>July 1, 1987<br>Thousands | Estimated<br>July 1, 1987<br>Number      | Estimated<br>July 1, 1987<br>Number |
| Maine.....                  | 12.3                     | 12.2                     | 12.0                                   | 1,355                                    | 7,245                               |
| New Hampshire.....          | 3.8                      | 4.1                      | 4.2                                    | 1,270                                    | 2,390                               |
| Vermont.....                | 6.6                      | 7.5                      | 7.9                                    | 1,775                                    | 6,015                               |
| Massachusetts.....          | 9.0                      | 9.4                      | 9.5                                    | 1,830                                    | 4,385                               |
| Rhode Island.....           | 1.3                      | 1.3                      | 1.3                                    | 190                                      | 615                                 |
| Connecticut.....            | 6.6                      | 6.8                      | 6.7                                    | 1,610                                    | 3,680                               |
| New York.....               | 57.6                     | 60.5                     | 61.7                                   | 21,370                                   | 48,580                              |
| New Jersey.....             | 14.4                     | 15.2                     | 15.5                                   | 2,355                                    | 5,785                               |
| Pennsylvania.....           | 63.8                     | 66.1                     | 66.7                                   | 20,380                                   | 42,575                              |
| Delaware.....               | 6.2                      | 6.2                      | 6.1                                    | 945                                      | 2,450                               |
| Maryland.....               | 22.8                     | 25.9                     | 27.3                                   | 4,595                                    | 11,860                              |
| <b>NORTHEAST.....</b>       | <b>204.4</b>             | <b>215.2</b>             | <b>218.9</b>                           | <b>57,675</b>                            | <b>135,580</b>                      |
| Ohio.....                   | 107.1                    | 107.8                    | 107.3                                  | 19,450                                   | 59,000                              |
| Indiana.....                | 114.4                    | 112.2                    | 111.0                                  | 20,115                                   | 63,105                              |
| Illinois.....               | 150.6                    | 150.6                    | 148.9                                  | 29,945                                   | 68,625                              |
| Iowa.....                   | 144.0                    | 147.7                    | 147.9                                  | 31,885                                   | 54,580                              |
| Missouri.....               | 155.9                    | 159.7                    | 161.2                                  | 32,990                                   | 91,400                              |
| <b>CORN BELT.....</b>       | <b>672.0</b>             | <b>678.0</b>             | <b>676.3</b>                           | <b>134,385</b>                           | <b>336,710</b>                      |
| Michigan.....               | 77.4                     | 80.3                     | 81.2                                   | 18,105                                   | 44,160                              |
| Wisconsin.....              | 98.0                     | 99.5                     | 99.1                                   | 34,705                                   | 89,605                              |
| Minnesota.....              | 144.1                    | 143.8                    | 141.9                                  | 47,100                                   | 64,070                              |
| <b>LAKE STATES.....</b>     | <b>319.5</b>             | <b>323.6</b>             | <b>322.2</b>                           | <b>99,910</b>                            | <b>197,835</b>                      |
| North Dakota.....           | 107.7                    | 101.1                    | 96.2                                   | 35,490                                   | 4,140                               |
| South Dakota.....           | 66.0                     | 68.0                     | 68.3                                   | 23,645                                   | 3,195                               |
| Nebraska.....               | 118.6                    | 118.9                    | 117.9                                  | 32,225                                   | 13,625                              |
| Kansas.....                 | 160.8                    | 159.4                    | 156.7                                  | 41,490                                   | 22,480                              |
| <b>GREAT PLAINS.....</b>    | <b>453.1</b>             | <b>447.4</b>             | <b>439.1</b>                           | <b>132,850</b>                           | <b>43,440</b>                       |
| West Virginia.....          | 19.2                     | 20.5                     | 20.9                                   | 5,050                                    | 21,040                              |
| Kentucky.....               | 119.3                    | 125.2                    | 127.8                                  | 16,210                                   | 43,165                              |
| Tennessee.....              | 96.4                     | 104.7                    | 108.7                                  | 12,490                                   | 57,260                              |
| Virginia.....               | 62.6                     | 68.0                     | 69.9                                   | 12,110                                   | 46,840                              |
| North Carolina.....         | 106.2                    | 103.3                    | 100.3                                  | 15,730                                   | 84,355                              |
| <b>APPALACHIAN.....</b>     | <b>403.7</b>             | <b>421.7</b>             | <b>427.6</b>                           | <b>61,590</b>                            | <b>252,660</b>                      |
| South Carolina.....         | 36.1                     | 34.6                     | 33.3                                   | 6,200                                    | 23,815                              |
| Georgia.....                | 74.3                     | 72.6                     | 70.9                                   | 12,775                                   | 32,850                              |
| Florida.....                | 49.4                     | 51.2                     | 51.6                                   | 12,205                                   | 7,530                               |
| Alabama.....                | 68.6                     | 67.4                     | 66.1                                   | 10,390                                   | 31,025                              |
| <b>SOUTHEAST.....</b>       | <b>228.4</b>             | <b>225.8</b>             | <b>221.9</b>                           | <b>41,570</b>                            | <b>95,220</b>                       |
| Mississippi.....            | 58.0                     | 59.0                     | 58.9                                   | 10,010                                   | 36,620                              |
| Louisiana.....              | 44.9                     | 44.3                     | 43.8                                   | 11,915                                   | 20,095                              |
| Arkansas.....               | 80.7                     | 79.3                     | 77.6                                   | 13,540                                   | 30,865                              |
| <b>DELTA STATES.....</b>    | <b>183.6</b>             | <b>182.6</b>             | <b>180.3</b>                           | <b>35,465</b>                            | <b>87,580</b>                       |
| Oklahoma.....               | 118.3                    | 122.8                    | 125.1                                  | 20,210                                   | 9,955                               |
| Texas.....                  | 239.0                    | 249.9                    | 263.8                                  | 60,350                                   | 19,450                              |
| <b>SOUTHERN PLAINS.....</b> | <b>357.3</b>             | <b>372.7</b>             | <b>388.9</b>                           | <b>80,560</b>                            | <b>29,405</b>                       |
| Montana.....                | 67.2                     | 68.2                     | 68.1                                   | 18,400                                   | 11,850                              |
| Idaho.....                  | 56.7                     | 57.1                     | 56.5                                   | 15,065                                   | 13,130                              |
| Wyoming.....                | 20.0                     | 22.1                     | 23.1                                   | 5,960                                    | 3,215                               |
| Colorado.....               | 63.4                     | 63.0                     | 62.1                                   | 19,355                                   | 6,080                               |
| New Mexico.....             | 23.9                     | 24.6                     | 24.8                                   | 7,245                                    | 3,015                               |
| Arizona.....                | 15.3                     | 16.6                     | 17.1                                   | 4,960                                    | 515                                 |
| Utah.....                   | 21.7                     | 23.3                     | 24.0                                   | 6,290                                    | 2,380                               |
| Nevada.....                 | 6.0                      | 6.5                      | 6.6                                    | 1,475                                    | 605                                 |
| <b>MOUNTAIN STATES.....</b> | <b>274.2</b>             | <b>281.4</b>             | <b>282.3</b>                           | <b>78,750</b>                            | <b>40,790</b>                       |
| Washington.....             | 64.7                     | 69.2                     | 70.4                                   | 15,730                                   | 22,825                              |
| Oregon.....                 | 54.4                     | 61.2                     | 58.6                                   | 20,405                                   | 25,900                              |
| California.....             | 134.6                    | 147.9                    | 153.5                                  | 61,110                                   | 32,055                              |
| <b>PACIFIC.....</b>         | <b>253.7</b>             | <b>278.3</b>             | <b>282.5</b>                           | <b>97,245</b>                            | <b>80,780</b>                       |
| <b>TOTAL.....</b>           | <b>3,349.9</b>           | <b>3,426.7</b>           | <b>3,440.0</b>                         | <b>820,000</b>                           | <b>1,300,000</b>                    |

<sup>1</sup>Includes engines used for stationary work such as irrigation, auxiliary engines on combines, balers, etc., and a small number of power units not elsewhere classified.

## Notebook (from pg. 6)

facturers who have achieved a truly monumental acceptance and substitution of chemical expense on the farm for machinery investment, and the expenses incident to effective tillage and crop rotation."

Today, with the Ohio State study confirming what his judgment and that of others had indicated, he says:

"Look, we are here to help farmers with their crop production problems. We have a mechanical solution to that problem that I'm trying to sell. There are chemical solutions to farmers' problems, too, and they're pushing theirs as hard as they can."

But, here we are, sitting tight and selling that combine with the tremendously improved life expectancy at a low-profit or no-profit price. The idea of justifying the purchase of it on a basis of what it will return in profit for the customer is largely ignored. "We have a tremendous deal for the farmer," notes Koenig, "But we don't really believe it ourselves and so we discount the price."

If anyone is interested in the ASAE paper which the Ohio dealers funded, it's "Updated Variable Costs of Farm Machinery Operation in Ohio" (ASAE 86-1027) by Joe A. Gliem and others in the Ohio State University ag engineering department. ASAE is at 2950 Niles Rd., St. Joseph, Mich. 49085-9659. I assure you it's short and to the point.

It ought to be a little embarrassing to the industry that it was left to a state dealer association with modest resources to fund this piece of work. A lot more needs to be done.

It seems strange that so few people in the machinery industry want to take the view that they must compete with the chemical industry for farmer dollars. Maybe they'll admit that this is the reality of the situation, but few apparently feel ready to go to the mat against those chemical heavyweights in the marketplace.

But if the data can be mustered to show farmers that in many cases they can ultimately profit more by very selectively putting more bucks into equipment and less into chemicals, it ought to produce more deals for dealers and manufacturers, and more profit for farmers.

And it also might give this industry the gumption to stick with a fair price rather than stampeding into repeats of *The Big Discount* when farmers need to be shown that the price is justified.

## Scanning the Stats: I&T's 50th Special

This is our 50th Market Statistics Issue. Take a walk through the tables (See Notebook, pg. 14)

# Principal Machines on Farms — 1987

| STATE                    | WHEEL TRACTORS           |                          |                                     | SELF-PROPELLED COMBINES  |                          |                                     | CORN HEADS               |                          |                                     |
|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
|                          | 1978<br>Census<br>Number | 1982<br>Census<br>Number | Estimated<br>July 1, 1987<br>Number | 1978<br>Census<br>Number | 1982<br>Census<br>Number | Estimated<br>July 1, 1987<br>Number | 1978<br>Census<br>Number | 1982<br>Census<br>Number | Estimated<br>July 1, 1987<br>Number |
| Maine .....              | 13,741                   | 13,569                   | 13,330                              | 388                      | 320                      | 275                                 | 183                      | 181                      | 175                                 |
| New Hampshire .....      | 4,877                    | 5,097                    | 5,165                               | 14                       | 8                        | 4                                   | 64                       | 50                       | 40                                  |
| Vermont .....            | 14,637                   | 15,274                   | 15,435                              | 156                      | 76                       | 62                                  | 346                      | 374                      | 370                                 |
| Massachusetts .....      | 9,840                    | 9,956                    | 9,910                               | 26                       | 23                       | 19                                  | 113                      | 145                      | 150                                 |
| Rhode Island .....       | 1,462                    | 1,364                    | 1,285                               | 13                       | 6                        | 4                                   | 17                       | 13                       | 10                                  |
| Connecticut .....        | 7,865                    | 8,421                    | 8,605                               | 86                       | 53                       | 41                                  | 157                      | 98                       | 70                                  |
| New York .....           | 120,215                  | 119,498                  | 118,065                             | 5,775                    | 6,030                    | 6,060                               | 3,401                    | 3,904                    | 4,010                               |
| New Jersey .....         | 20,655                   | 20,554                   | 20,320                              | 1,086                    | 1,011                    | 940                                 | 532                      | 593                      | 590                                 |
| Pennsylvania .....       | 137,998                  | 136,505                  | 134,505                             | 9,674                    | 9,707                    | 9,570                               | 4,409                    | 5,408                    | 5,690                               |
| Delaware .....           | 8,348                    | 8,012                    | 7,780                               | 1,314                    | 1,342                    | 1,340                               | 1,003                    | 1,006                    | 970                                 |
| Maryland .....           | 36,251                   | 36,951                   | 36,945                              | 3,518                    | 3,279                    | 3,105                               | 2,732                    | 2,840                    | 2,795                               |
| NORTHEAST .....          | 375,889                  | 375,201                  | 371,345                             | 22,050                   | 21,855                   | 21,420                              | 12,957                   | 14,612                   | 14,870                              |
| Ohio .....               | 198,865                  | 193,367                  | 188,740                             | 33,449                   | 33,200                   | 32,570                              | 24,438                   | 26,403                   | 26,475                              |
| Indiana .....            | 176,767                  | 167,563                  | 161,130                             | 37,403                   | 34,646                   | 32,725                              | 32,638                   | 31,391                   | 29,860                              |
| Illinois .....           | 277,604                  | 262,112                  | 254,765                             | 63,230                   | 61,411                   | 59,680                              | 55,793                   | 55,636                   | 53,680                              |
| Iowa .....               | 323,132                  | 305,334                  | 294,440                             | 55,586                   | 57,726                   | 58,390                              | 53,030                   | 57,046                   | 57,050                              |
| Missouri .....           | 198,225                  | 193,758                  | 190,135                             | 33,378                   | 32,957                   | 32,240                              | 23,056                   | 21,834                   | 20,435                              |
| CORN BELT .....          | 1,174,593                | 1,122,134                | 1,089,210                           | 223,045                  | 219,940                  | 215,605                             | 188,955                  | 192,310                  | 187,500                             |
| Michigan .....           | 148,063                  | 146,655                  | 144,825                             | 18,919                   | 21,060                   | 21,490                              | 11,076                   | 13,583                   | 14,480                              |
| Wisconsin .....          | 252,594                  | 243,827                  | 237,605                             | 18,262                   | 19,215                   | 19,415                              | 8,458                    | 11,939                   | 13,425                              |
| Minnesota .....          | 277,920                  | 264,581                  | 256,150                             | 44,841                   | 45,847                   | 45,830                              | 27,197                   | 31,098                   | 37,070                              |
| LAKE STATES .....        | 678,577                  | 655,063                  | 638,580                             | 82,022                   | 86,122                   | 86,735                              | 46,731                   | 56,620                   | 59,975                              |
| North Dakota .....       | 120,191                  | 108,103                  | 102,100                             | 30,782                   | 27,546                   | 26,110                              | 1,619                    | 2,708                    | 3,090                               |
| South Dakota .....       | 111,485                  | 105,699                  | 100,765                             | 16,503                   | 16,961                   | 16,955                              | 7,759                    | 9,606                    | 10,430                              |
| Nebraska .....           | 175,569                  | 164,308                  | 159,105                             | 35,083                   | 34,032                   | 33,035                              | 24,623                   | 25,484                   | 25,535                              |
| Kansas .....             | 157,327                  | 149,870                  | 145,305                             | 47,142                   | 46,662                   | 45,745                              | 9,150                    | 8,321                    | 7,345                               |
| GREAT PLAINS .....       | 564,572                  | 527,980                  | 507,275                             | 129,510                  | 125,201                  | 121,845                             | 43,151                   | 48,119                   | 46,400                              |
| West Virginia .....      | 24,901                   | 27,110                   | 27,820                              | 479                      | 562                      | 615                                 | 265                      | 471                      | 500                                 |
| Kentucky .....           | 157,432                  | 163,176                  | 163,620                             | 10,568                   | 11,466                   | 11,805                              | 8,382                    | 9,924                    | 10,370                              |
| Tennessee .....          | 120,161                  | 126,365                  | 129,320                             | 10,765                   | 11,227                   | 11,310                              | 5,581                    | 6,508                    | 6,765                               |
| Virginia .....           | 83,836                   | 88,511                   | 89,240                              | 5,878                    | 6,224                    | 6,300                               | 4,255                    | 5,061                    | 5,205                               |
| North Carolina .....     | 145,863                  | 131,488                  | 126,030                             | 13,297                   | 13,820                   | 12,300                              | 10,326                   | 10,618                   | 10,360                              |
| APPALACHIAN .....        | 532,193                  | 536,650                  | 536,030                             | 40,987                   | 42,299                   | 42,330                              | 28,809                   | 32,582                   | 33,200                              |
| South Carolina .....     | 47,967                   | 44,338                   | 41,585                              | 6,420                    | 6,263                    | 6,050                               | 3,854                    | 3,808                    | 3,660                               |
| Georgia .....            | 79,031                   | 75,505                   | 72,685                              | 9,589                    | 8,980                    | 8,570                               | 7,302                    | 6,438                    | 5,795                               |
| Florida .....            | 51,099                   | 52,346                   | 52,345                              | 1,726                    | 1,742                    | 1,705                               | 1,112                    | 1,307                    | 1,345                               |
| Alabama .....            | 69,438                   | 66,330                   | 63,910                              | 6,660                    | 6,935                    | 6,995                               | 3,383                    | 3,630                    | 3,615                               |
| SOUTHEAST .....          | 247,535                  | 238,519                  | 230,525                             | 24,395                   | 23,920                   | 23,320                              | 15,651                   | 15,183                   | 14,415                              |
| Mississippi .....        | 72,483                   | 70,139                   | 68,570                              | 9,911                    | 9,695                    | 9,455                               | 527                      | 861                      | 980                                 |
| Louisiana .....          | 58,373                   | 56,883                   | 55,705                              | 9,624                    | 8,468                    | 7,740                               | 377                      | 286                      | 235                                 |
| Arkansas .....           | 84,108                   | 81,556                   | 79,665                              | 13,960                   | 12,891                   | 12,150                              | 292                      | 221                      | 185                                 |
| DELTA STATES .....       | 214,964                  | 208,578                  | 203,940                             | 33,495                   | 31,054                   | 29,345                              | 1,196                    | 1,368                    | 1,400                               |
| Oklahoma .....           | 99,771                   | 99,934                   | 99,210                              | 17,647                   | 17,299                   | 16,855                              | 822                      | 600                      | 480                                 |
| Texas .....              | 262,886                  | 264,740                  | 264,125                             | 23,026                   | 21,049                   | 19,615                              | 3,628                    | 3,913                    | 3,920                               |
| SOUTHERN<br>PLAINS ..... | 362,657                  | 364,674                  | 363,335                             | 40,673                   | 38,348                   | 36,470                              | 4,450                    | 4,513                    | 4,400                               |
| Montana .....            | 54,737                   | 54,666                   | 54,110                              | 13,180                   | 12,038                   | 11,140                              | 101                      | 89                       | 70                                  |
| Idaho .....              | 53,552                   | 50,575                   | 48,755                              | 9,843                    | 9,309                    | 8,870                               | 414                      | 344                      | 320                                 |
| Wyoming .....            | 19,322                   | 20,673                   | 21,090                              | 1,999                    | 1,991                    | 1,955                               | 171                      | 221                      | 240                                 |
| Colorado .....           | 58,331                   | 56,141                   | 54,790                              | 8,404                    | 7,994                    | 7,690                               | 2,397                    | 2,618                    | 2,610                               |
| New Mexico .....         | 16,601                   | 17,455                   | 17,600                              | 1,513                    | 1,346                    | 1,220                               | 246                      | 308                      | 330                                 |
| Arizona .....            | 11,956                   | 12,262                   | 12,265                              | 509                      | 369                      | 285                                 | 60                       | 94                       | 95                                  |
| Utah .....               | 21,145                   | 21,613                   | 21,585                              | 1,743                    | 1,591                    | 1,460                               | 186                      | 225                      | 235                                 |
| Nevada .....             | 5,142                    | 5,160                    | 5,125                               | 263                      | 234                      | 195                                 | 3                        | 19                       | 20                                  |
| MOUNTAIN<br>STATES ..... | 240,786                  | 238,545                  | 235,320                             | 37,454                   | 34,872                   | 32,815                              | 3,578                    | 3,918                    | 3,920                               |
| Washington .....         | 53,301                   | 59,377                   | 61,640                              | 8,431                    | 8,314                    | 8,125                               | 470                      | 558                      | 580                                 |
| Oregon .....             | 48,158                   | 53,243                   | 55,310                              | 6,335                    | 6,235                    | 6,080                               | *                        | 209                      | 210                                 |
| California .....         | 129,480                  | 139,735                  | 144,490                             | 6,270                    | 6,102                    | 5,910                               | 1,016                    | 1,123                    | 1,130                               |
| PACIFIC .....            | 230,939                  | 252,355                  | 261,440                             | 21,036                   | 20,651                   | 20,115                              | 1,486                    | 1,890                    | 1,920                               |
| TOTAL .....              | 4,622,705                | 4,519,699                | 4,437,000                           | 654,667                  | 644,262                  | 630,000                             | 346,964                  | 369,115                  | 368,000                             |

\*Not reported separately.

# Principal Machines on Farms — 1987

| STATE                   | POWER<br>ELEVATORS<br>Estimated<br>July 1, 1987<br>Number | MANURE<br>SPREADERS<br>Estimated<br>July 1, 1987<br>Number | CORN &<br>COTTON<br>PLANTERS<br>Estimated<br>July 1, 1987<br>Number | GRAIN<br>DRILLS<br>Estimated<br>July 1, 1987<br>Number | MOLDBOARD<br>PLOWS<br>Estimated<br>July 1, 1987<br>Number | SIDE DELIVERY<br>RAKES<br>Estimated<br>July 1, 1987<br>Number | POWER<br>TRACTOR<br>MOWERS*<br>Estimated<br>July 1, 1987<br>Number |
|-------------------------|-----------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------|
| Maine.....              | 4,830                                                     | 2,845                                                      | 290                                                                 | 780                                                    | 7,760                                                     | 5,345                                                         | 6,090                                                              |
| New Hampshire.....      | 2,280                                                     | 1,820                                                      | 260                                                                 | 55                                                     | 2,650                                                     | 2,265                                                         | 2,780                                                              |
| Vermont.....            | 7,340                                                     | 5,730                                                      | 1,460                                                               | 290                                                    | 8,965                                                     | 6,750                                                         | 8,260                                                              |
| Massachusetts.....      | 3,290                                                     | 2,070                                                      | 800                                                                 | 105                                                    | 5,365                                                     | 3,215                                                         | 3,650                                                              |
| Rhode Island.....       | 460                                                       | 240                                                        | 95                                                                  | 25                                                     | 620                                                       | 295                                                           | 295                                                                |
| Connecticut.....        | 3,835                                                     | 2,225                                                      | 935                                                                 | 75                                                     | 5,090                                                     | 2,275                                                         | 3,200                                                              |
| New York.....           | 63,965                                                    | 36,605                                                     | 17,915                                                              | 24,510                                                 | 70,980                                                    | 43,780                                                        | 50,880                                                             |
| New Jersey.....         | 5,620                                                     | 2,190                                                      | 2,190                                                               | 2,245                                                  | 14,790                                                    | 3,665                                                         | 4,200                                                              |
| Pennsylvania.....       | 68,095                                                    | 37,900                                                     | 30,870                                                              | 36,785                                                 | 90,160                                                    | 45,150                                                        | 56,400                                                             |
| Delaware.....           | 3,615                                                     | 1,600                                                      | 1,925                                                               | 1,855                                                  | 5,685                                                     | 960                                                           | 965                                                                |
| Maryland.....           | 15,010                                                    | 7,635                                                      | 7,875                                                               | 8,105                                                  | 25,505                                                    | 8,215                                                         | 10,450                                                             |
| NORTHEAST.....          | 178,340                                                   | 100,860                                                    | 64,615                                                              | 74,830                                                 | 237,570                                                   | 121,915                                                       | 147,170                                                            |
| Ohio.....               | 116,975                                                   | 51,250                                                     | 58,440                                                              | 58,600                                                 | 144,930                                                   | 51,385                                                        | 59,645                                                             |
| Indiana.....            | 116,065                                                   | 45,320                                                     | 59,925                                                              | 47,735                                                 | 123,770                                                   | 37,920                                                        | 46,635                                                             |
| Illinois.....           | 176,645                                                   | 66,290                                                     | 87,665                                                              | 60,190                                                 | 160,550                                                   | 49,205                                                        | 65,670                                                             |
| Iowa.....               | 186,545                                                   | 90,470                                                     | 97,475                                                              | 55,840                                                 | 191,295                                                   | 83,170                                                        | 99,095                                                             |
| Missouri.....           | 82,725                                                    | 50,860                                                     | 46,695                                                              | 48,525                                                 | 134,845                                                   | 49,110                                                        | 80,065                                                             |
| CORN BELT.....          | 678,955                                                   | 304,190                                                    | 350,200                                                             | 270,890                                                | 755,390                                                   | 270,790                                                       | 351,110                                                            |
| Michigan.....           | 82,900                                                    | 33,440                                                     | 35,440                                                              | 47,140                                                 | 116,950                                                   | 40,295                                                        | 44,270                                                             |
| Wisconsin.....          | 130,750                                                   | 76,780                                                     | 62,490                                                              | 60,090                                                 | 149,675                                                   | 84,260                                                        | 95,740                                                             |
| Minnesota.....          | 146,465                                                   | 69,460                                                     | 75,225                                                              | 69,675                                                 | 161,440                                                   | 81,485                                                        | 89,120                                                             |
| LAKE STATES.....        | 360,115                                                   | 179,680                                                    | 173,155                                                             | 176,905                                                | 427,965                                                   | 206,040                                                       | 229,130                                                            |
| North Dakota.....       | 71,020                                                    | 18,900                                                     | 14,020                                                              | 55,145                                                 | 59,215                                                    | 21,250                                                        | 37,665                                                             |
| South Dakota.....       | 63,060                                                    | 26,410                                                     | 28,370                                                              | 31,230                                                 | 59,415                                                    | 21,635                                                        | 43,975                                                             |
| Nebraska.....           | 97,710                                                    | 40,465                                                     | 42,360                                                              | 40,025                                                 | 84,330                                                    | 32,870                                                        | 50,875                                                             |
| Kansas.....             | 104,260                                                   | 33,740                                                     | 20,535                                                              | 65,030                                                 | 85,610                                                    | 33,760                                                        | 50,385                                                             |
| GREAT PLAINS.....       | 336,050                                                   | 119,515                                                    | 105,285                                                             | 191,430                                                | 288,570                                                   | 109,515                                                       | 182,900                                                            |
| West Virginia.....      | 6,290                                                     | 7,650                                                      | 4,885                                                               | 3,410                                                  | 17,645                                                    | 9,010                                                         | 17,355                                                             |
| Kentucky.....           | 24,270                                                    | 25,225                                                     | 35,935                                                              | 10,525                                                 | 100,240                                                   | 29,200                                                        | 46,735                                                             |
| Tennessee.....          | 14,955                                                    | 18,400                                                     | 48,570                                                              | 13,145                                                 | 65,050                                                    | 23,270                                                        | 50,090                                                             |
| Virginia.....           | 18,490                                                    | 19,685                                                     | 24,185                                                              | 15,860                                                 | 60,405                                                    | 22,180                                                        | 30,565                                                             |
| North Carolina.....     | 20,245                                                    | 19,270                                                     | 68,215                                                              | 21,250                                                 | 58,030                                                    | 15,150                                                        | 31,060                                                             |
| APPALACHIAN.....        | 84,250                                                    | 90,230                                                     | 181,790                                                             | 64,190                                                 | 301,370                                                   | 98,810                                                        | 175,805                                                            |
| South Carolina.....     | 4,595                                                     | 3,560                                                      | 28,580                                                              | 10,970                                                 | 10,085                                                    | 5,595                                                         | 9,560                                                              |
| Georgia.....            | 13,740                                                    | 6,030                                                      | 36,330                                                              | 9,460                                                  | 28,670                                                    | 10,080                                                        | 15,925                                                             |
| Florida.....            | 3,645                                                     | 1,085                                                      | 5,575                                                               | 1,640                                                  | 18,585                                                    | 1,830                                                         | 3,630                                                              |
| Alabama.....            | 11,280                                                    | 4,025                                                      | 39,585                                                              | 6,650                                                  | 21,450                                                    | 7,230                                                         | 15,580                                                             |
| SOUTHEAST.....          | 33,260                                                    | 14,700                                                     | 110,070                                                             | 28,720                                                 | 78,790                                                    | 24,735                                                        | 44,695                                                             |
| Mississippi.....        | 7,715                                                     | 4,600                                                      | 49,160                                                              | 7,825                                                  | 27,090                                                    | 9,275                                                         | 20,610                                                             |
| Louisiana.....          | 2,520                                                     | 2,650                                                      | 16,585                                                              | 7,000                                                  | 20,265                                                    | 5,990                                                         | 10,400                                                             |
| Arkansas.....           | 9,415                                                     | 6,460                                                      | 20,435                                                              | 12,500                                                 | 44,785                                                    | 10,000                                                        | 19,915                                                             |
| DELTA STATES.....       | 19,650                                                    | 13,710                                                     | 86,180                                                              | 27,325                                                 | 92,140                                                    | 25,265                                                        | 50,925                                                             |
| Oklahoma.....           | 25,130                                                    | 8,390                                                      | 8,640                                                               | 30,540                                                 | 74,935                                                    | 19,010                                                        | 31,160                                                             |
| Texas.....              | 39,990                                                    | 15,925                                                     | 51,925                                                              | 47,835                                                 | 85,710                                                    | 22,080                                                        | 45,255                                                             |
| SOUTHERN<br>PLAINS..... | 65,120                                                    | 24,315                                                     | 60,565                                                              | 78,375                                                 | 160,645                                                   | 41,090                                                        | 76,415                                                             |
| Montana.....            | 27,960                                                    | 9,890                                                      | 1,025                                                               | 20,655                                                 | 26,620                                                    | 13,365                                                        | 20,615                                                             |
| Idaho.....              | 24,410                                                    | 12,335                                                     | 2,500                                                               | 15,020                                                 | 32,330                                                    | 15,645                                                        | 20,510                                                             |
| Wyoming.....            | 5,020                                                     | 4,230                                                      | 900                                                                 | 4,000                                                  | 15,175                                                    | 5,040                                                         | 5,895                                                              |
| Colorado.....           | 25,150                                                    | 12,590                                                     | 5,845                                                               | 14,925                                                 | 25,415                                                    | 13,760                                                        | 15,125                                                             |
| New Mexico.....         | 2,570                                                     | 2,050                                                      | 2,970                                                               | 1,890                                                  | 8,500                                                     | 4,060                                                         | 4,525                                                              |
| Arizona.....            | 1,800                                                     | 870                                                        | 1,785                                                               | 1,375                                                  | 3,260                                                     | 1,365                                                         | 1,950                                                              |
| Utah.....               | 10,035                                                    | 6,825                                                      | 1,600                                                               | 5,320                                                  | 14,680                                                    | 9,040                                                         | 10,400                                                             |
| Nevada.....             | 940                                                       | 1,005                                                      | 60                                                                  | 310                                                    | 2,470                                                     | 1,445                                                         | 1,500                                                              |
| MOUNTAIN<br>STATES..... | 97,885                                                    | 49,795                                                     | 16,685                                                              | 63,495                                                 | 128,450                                                   | 63,720                                                        | 80,520                                                             |
| Washington.....         | 21,710                                                    | 13,010                                                     | 1,725                                                               | 16,700                                                 | 35,895                                                    | 13,170                                                        | 19,915                                                             |
| Oregon.....             | 17,495                                                    | 11,485                                                     | 1,065                                                               | 11,495                                                 | 34,890                                                    | 11,585                                                        | 18,735                                                             |
| California.....         | 24,170                                                    | 13,510                                                     | 8,655                                                               | 8,645                                                  | 58,325                                                    | 13,365                                                        | 22,680                                                             |
| PACIFIC.....            | 63,375                                                    | 38,005                                                     | 11,455                                                              | 36,840                                                 | 129,110                                                   | 38,120                                                        | 61,330                                                             |
| TOTAL.....              | 1,917,000                                                 | 935,000                                                    | 1,160,000                                                           | 1,013,000                                              | 2,600,000                                                 | 1,000,000                                                     | 1,400,000                                                          |

\*Cutter bar type only.

# Principal Machines on Farms — 1987

| STATE                    | PICK-UP BALERS           |                          |                                     | FIELD FORAGE HARVESTERS <sup>1</sup> |                          |                                     | MOWER CONDITIONERS <sup>2</sup> |                          |                                     |
|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------------------|--------------------------|-------------------------------------|---------------------------------|--------------------------|-------------------------------------|
|                          | 1978<br>Census<br>Number | 1982<br>Census<br>Number | Estimated<br>July 1, 1987<br>Number | 1978<br>Census<br>Number             | 1982<br>Census<br>Number | Estimated<br>July 1, 1987<br>Number | 1978<br>Census<br>Number        | 1982<br>Census<br>Number | Estimated<br>July 1, 1987<br>Number |
| Maine .....              | 2,609                    | 3,047                    | 3,160                               | 1,309                                | 1,181                    | 1,095                               | 2,023                           | 2,353                    | 2,575                               |
| New Hampshire .....      | 1,254                    | 1,259                    | 1,220                               | 545                                  | 544                      | 520                                 | 889                             | 960                      | 1,020                               |
| Vermont .....            | 4,082                    | 4,167                    | 4,090                               | 2,707                                | 2,569                    | 2,390                               | 3,777                           | 3,866                    | 3,960                               |
| Massachusetts .....      | 1,732                    | 1,704                    | 1,535                               | 1,092                                | 1,083                    | 1,045                               | 1,472                           | 1,533                    | 1,590                               |
| Rhode Island .....       | 181                      | 205                      | 205                                 | 113                                  | 93                       | 75                                  | 124                             | 146                      | 160                                 |
| Connecticut .....        | 1,509                    | 1,508                    | 1,460                               | 804                                  | 773                      | 730                                 | 1,063                           | 1,318                    | 1,490                               |
| New York .....           | 28,853                   | 28,078                   | 26,850                              | 20,298                               | 19,040                   | 17,810                              | 25,390                          | 25,603                   | 26,010                              |
| New Jersey .....         | 2,194                    | 2,260                    | 2,235                               | 1,093                                | 1,165                    | 1,160                               | 2,275                           | 2,386                    | 2,475                               |
| Pennsylvania .....       | 37,288                   | 37,257                   | 36,070                              | 18,891                               | 18,078                   | 16,940                              | 29,419                          | 29,456                   | 29,845                              |
| Delaware .....           | 568                      | 531                      | 500                                 | 269                                  | 249                      | 225                                 | 587                             | 519                      | 485                                 |
| Maryland .....           | 5,581                    | 5,719                    | 5,615                               | 2,852                                | 2,670                    | 2,515                               | 4,653                           | 5,136                    | 5,445                               |
| NORTHEAST .....          | 85,851                   | 85,735                   | 82,940                              | 49,973                               | 47,465                   | 44,505                              | 71,672                          | 73,276                   | 75,055                              |
| Ohio .....               | 38,496                   | 39,754                   | 39,115                              | 11,209                               | 11,090                   | 10,690                              | 26,997                          | 26,143                   | 26,020                              |
| Indiana .....            | 23,838                   | 23,947                   | 23,350                              | 6,912                                | 6,917                    | 6,695                               | 15,733                          | 15,583                   | 15,640                              |
| Illinois .....           | 30,632                   | 30,463                   | 29,460                              | 11,557                               | 9,972                    | 8,905                               | 21,173                          | 21,867                   | 22,490                              |
| Iowa .....               | 47,389                   | 47,776                   | 46,800                              | 19,393                               | 17,638                   | 16,260                              | 26,375                          | 28,401                   | 29,895                              |
| Missouri .....           | 43,981                   | 48,662                   | 49,070                              | 8,704                                | 8,055                    | 7,450                               | 23,469                          | 26,527                   | 28,435                              |
| CORN BELT .....          | 184,336                  | 190,602                  | 187,795                             | 57,775                               | 53,672                   | 50,000                              | 113,747                         | 118,521                  | 122,480                             |
| Michigan .....           | 24,536                   | 25,051                   | 24,630                              | 12,704                               | 11,809                   | 10,940                              | 20,696                          | 21,055                   | 21,540                              |
| Wisconsin .....          | 58,443                   | 58,042                   | 56,360                              | 43,154                               | 43,880                   | 42,925                              | 51,830                          | 51,630                   | 52,015                              |
| Minnesota .....          | 50,165                   | 51,038                   | 50,055                              | 23,341                               | 23,803                   | 23,260                              | 31,714                          | 32,050                   | 32,615                              |
| LAKE STATES .....        | 133,144                  | 134,131                  | 131,045                             | 79,199                               | 79,492                   | 77,125                              | 104,240                         | 104,735                  | 106,170                             |
| North Dakota .....       | 15,180                   | 16,628                   | 16,850                              | 5,538                                | 4,839                    | 4,455                               | 6,315                           | 6,181                    | 6,160                               |
| South Dakota .....       | 14,174                   | 17,966                   | 19,310                              | 11,280                               | 10,568                   | 9,875                               | 5,673                           | 6,958                    | 7,230                               |
| Nebraska .....           | 16,968                   | 18,906                   | 19,510                              | 13,870                               | 12,538                   | 11,520                              | 14,740                          | 15,497                   | 16,165                              |
| Kansas .....             | 29,222                   | 31,998                   | 32,600                              | 10,778                               | 9,367                    | 8,380                               | 17,144                          | 18,932                   | 20,010                              |
| GREAT PLAINS .....       | 75,544                   | 85,498                   | 88,270                              | 41,466                               | 37,312                   | 34,230                              | 43,872                          | 47,568                   | 49,565                              |
| West Virginia .....      | 9,119                    | 10,550                   | 10,985                              | 2,094                                | 2,323                    | 2,340                               | 5,035                           | 6,033                    | 6,615                               |
| Kentucky .....           | 31,575                   | 35,143                   | 36,160                              | 7,752                                | 7,910                    | 7,750                               | 23,656                          | 23,805                   | 24,260                              |
| Tennessee .....          | 22,028                   | 26,506                   | 28,080                              | 5,202                                | 6,313                    | 6,675                               | 16,834                          | 18,734                   | 19,710                              |
| Virginia .....           | 17,932                   | 21,805                   | 22,760                              | 6,075                                | 6,209                    | 6,050                               | 12,404                          | 14,659                   | 16,165                              |
| North Carolina .....     | 12,461                   | 12,752                   | 12,365                              | 4,204                                | 3,502                    | 2,995                               | 10,577                          | 10,888                   | 11,110                              |
| APPALACHIAN .....        | 93,115                   | 106,756                  | 110,350                             | 25,327                               | 26,257                   | 25,810                              | 68,506                          | 74,119                   | 77,860                              |
| South Carolina .....     | 4,404                    | 4,823                    | 4,780                               | 1,369                                | 1,260                    | 1,160                               | 3,370                           | 4,033                    | 4,430                               |
| Georgia .....            | 8,671                    | 10,407                   | 10,935                              | 2,652                                | 2,717                    | 2,660                               | 9,176                           | 9,465                    | 9,695                               |
| Florida .....            | 2,787                    | 3,754                    | 4,120                               | 903                                  | 861                      | 815                                 | 6,406                           | 7,591                    | 8,385                               |
| Alabama .....            | 10,068                   | 11,322                   | 11,530                              | 2,102                                | 2,112                    | 2,050                               | 8,349                           | 8,212                    | 8,235                               |
| SOUTHEAST .....          | 25,930                   | 30,306                   | 31,365                              | 7,026                                | 6,950                    | 6,685                               | 27,301                          | 29,301                   | 30,745                              |
| Mississippi .....        | 8,286                    | 10,509                   | 11,280                              | 2,003                                | 1,927                    | 1,835                               | 7,294                           | 7,949                    | 8,395                               |
| Louisiana .....          | 5,666                    | 6,425                    | 6,620                               | 1,299                                | 1,327                    | 1,290                               | 6,587                           | 6,698                    | 6,845                               |
| Arkansas .....           | 10,783                   | 13,994                   | 15,275                              | 1,882                                | 1,634                    | 1,450                               | 8,366                           | 10,035                   | 11,070                              |
| DELTA STATES .....       | 24,735                   | 30,928                   | 33,175                              | 5,184                                | 4,888                    | 4,575                               | 22,247                          | 24,682                   | 26,310                              |
| Oklahoma .....           | 19,242                   | 22,690                   | 23,745                              | 2,420                                | 2,491                    | 2,455                               | 14,990                          | 17,107                   | 18,490                              |
| Texas .....              | 26,382                   | 33,736                   | 35,570                              | 5,339                                | 5,109                    | 4,820                               | 32,449                          | 39,629                   | 37,800                              |
| SOUTHERN<br>PLAINS ..... | 45,624                   | 56,426                   | 59,315                              | 7,759                                | 7,600                    | 7,275                               | 47,439                          | 56,736                   | 56,290                              |
| Montana .....            | 11,692                   | 12,468                   | 12,540                              | 2,086                                | 2,429                    | 2,510                               | 7,304                           | 8,102                    | 8,580                               |
| Idaho .....              | 12,862                   | 12,210                   | 11,580                              | 2,391                                | 2,384                    | 2,305                               | 9,029                           | 8,515                    | 8,345                               |
| Wyoming .....            | 4,468                    | 5,066                    | 5,250                               | 1,261                                | 1,222                    | 1,160                               | 3,433                           | 3,904                    | 4,200                               |
| Colorado .....           | 10,374                   | 10,365                   | 10,050                              | 4,355                                | 3,503                    | 3,005                               | 7,259                           | 7,040                    | 7,025                               |
| New Mexico .....         | 3,252                    | 3,403                    | 3,400                               | 774                                  | 802                      | 795                                 | 2,317                           | 2,395                    | 2,475                               |
| Arizona .....            | 1,004                    | 6,942                    | 1,025                               | 298                                  | 348                      | 355                                 | 780                             | 861                      | 915                                 |
| Utah .....               | 6,922                    | 6,965                    | 6,790                               | 1,874                                | 1,978                    | 1,970                               | 5,098                           | 5,547                    | 5,860                               |
| Nevada .....             | 1,470                    | 1,598                    | 1,605                               | 353                                  | 437                      | 465                                 | 1,245                           | 1,314                    | 1,375                               |
| MOUNTAIN<br>STATES ..... | 52,044                   | 53,117                   | 52,240                              | 13,392                               | 13,103                   | 12,565                              | 36,465                          | 37,678                   | 38,775                              |
| Washington .....         | 8,717                    | 9,518                    | 9,635                               | 2,890                                | 3,060                    | 3,050                               | 8,107                           | 9,838                    | 10,910                              |
| Oregon .....             | 8,443                    | 9,730                    | 10,110                              | 2,602                                | 2,555                    | 2,450                               | 7,033                           | 8,528                    | 9,430                               |
| California .....         | 6,358                    | 6,725                    | 6,760                               | 2,530                                | 2,715                    | 2,730                               | 7,558                           | 9,299                    | 10,410                              |
| PACIFIC .....            | 23,518                   | 25,973                   | 26,505                              | 8,022                                | 8,330                    | 8,230                               | 22,698                          | 27,665                   | 30,750                              |
| TOTAL .....              | 743,841                  | 799,472                  | 803,000                             | 295,123                              | 285,069                  | 271,000                             | 558,187                         | 594,281                  | 614,000                             |

<sup>1</sup>Shear-bar type. <sup>2</sup>Does not include windrowers with conditioning rolls.

# Farm Wheel Tractor Retail Sales by State, 1983-1986

(In Units)

| State          | 1983           |               |                | 1984           |               |                | 1985           |               |                | 1986           |               |                |
|----------------|----------------|---------------|----------------|----------------|---------------|----------------|----------------|---------------|----------------|----------------|---------------|----------------|
|                | 2-wheel Drive  | 4-wheel Drive | Total Tractors | 2-wheel Drive  | 4-wheel Drive | Total Tractors | 2-wheel Drive  | 4-wheel Drive | Total Tractors | 2-wheel Drive  | 4-wheel Drive | Total Tractors |
| Alabama        | 2,325          | 3             | 2,328          | 2,653          | 10            | 2,663          | 2,872          | 2             | 2,874          | 3,041          | —             | 3,041          |
| Alaska         | 78             | —             | 78             | 71             | —             | 71             | 39             | —             | 39             | 22             | —             | 22             |
| Arizona        | 619            | 27            | 646            | 782            | 30            | 812            | 1,240          | 29            | 1,269          | 657            | 16            | 673            |
| Arkansas       | 3,582          | 139           | 3,721          | 3,714          | 91            | 3,805          | 3,683          | 70            | 3,753          | 3,154          | 55            | 3,209          |
| California     | 5,040          | 214           | 5,254          | 5,946          | 186           | 6,132          | 4,931          | 74            | 5,005          | 5,138          | 73            | 5,211          |
| Colorado       | 1,188          | 126           | 1,314          | 1,234          | 106           | 1,340          | 983            | 89            | 1,072          | 711            | 50            | 761            |
| Connecticut    | 491            | -2            | 489            | 618            | 3             | 621            | 715            | 1             | 716            | 937            | —             | 937            |
| Delaware       | 258            | 4             | 262            | 248            | 7             | 255            | 286            | 7             | 293            | 351            | 6             | 357            |
| Florida        | 3,622          | 68            | 3,690          | 4,614          | 19            | 4,633          | 4,543          | 30            | 4,573          | 4,732          | 31            | 4,763          |
| Georgia        | 3,660          | 6             | 3,666          | 4,655          | 10            | 4,665          | 5,242          | 5             | 5,247          | 5,077          | 6             | 5,083          |
| Hawaii         | 141            | —             | 141            | 116            | 5             | 121            | 126            | 9             | 135            | 142            | 4             | 146            |
| Idaho          | 1,013          | 131           | 1,144          | 1,062          | 117           | 1,179          | 786            | 83            | 869            | 483            | 35            | 518            |
| Illinois       | 4,658          | 433           | 5,091          | 3,958          | 312           | 4,270          | 3,327          | 252           | 3,579          | 3,182          | 155           | 3,337          |
| Indiana        | 2,837          | 197           | 3,034          | 2,801          | 135           | 2,936          | 2,789          | 113           | 2,902          | 2,784          | 68            | 2,852          |
| Iowa           | 4,149          | 284           | 4,433          | 2,964          | 129           | 3,093          | 1,894          | 68            | 1,962          | 2,022          | 69            | 2,091          |
| Kansas         | 2,575          | 403           | 2,978          | 2,199          | 342           | 2,541          | 1,739          | 248           | 1,987          | 1,585          | 134           | 1,719          |
| Kentucky       | 3,244          | 21            | 3,265          | 2,945          | 15            | 2,960          | 3,044          | 23            | 3,067          | 2,643          | 11            | 2,654          |
| Louisiana      | 4,143          | 64            | 4,207          | 3,894          | 48            | 3,942          | 3,419          | 66            | 3,485          | 2,602          | 15            | 2,617          |
| Maine          | 549            | 1             | 550            | 615            | —             | 615            | 625            | —             | 625            | 806            | —             | 806            |
| Maryland       | 1,440          | 17            | 1,457          | 1,683          | 7             | 1,690          | 2,139          | 3             | 2,142          | 2,081          | 1             | 2,082          |
| Massachusetts  | 517            | —             | 517            | 621            | —             | 621            | 783            | —             | 783            | 999            | —             | 999            |
| Michigan       | 2,569          | 143           | 2,712          | 2,751          | 132           | 2,883          | 2,975          | 74            | 3,049          | 3,051          | 51            | 3,102          |
| Minnesota      | 3,029          | 386           | 3,415          | 2,441          | 295           | 2,736          | 1,714          | 202           | 1,916          | 1,651          | 183           | 1,834          |
| Mississippi    | 2,571          | 31            | 2,602          | 3,030          | 25            | 3,055          | 3,172          | 20            | 3,192          | 2,516          | 7             | 2,523          |
| Missouri       | 3,086          | 118           | 3,204          | 3,036          | 75            | 3,111          | 3,159          | 35            | 3,194          | 3,290          | 38            | 3,328          |
| Montana        | 861            | 260           | 1,121          | 677            | 195           | 872            | 602            | 122           | 724            | 323            | 103           | 476            |
| Nebraska       | 2,121          | 168           | 2,289          | 1,598          | 99            | 1,697          | 963            | 63            | 1,026          | 1,258          | 66            | 1,324          |
| Nevada         | 79             | 4             | 83             | 82             | 6             | 88             | 113            | 4             | 117            | 102            | 2             | 104            |
| New Hampshire  | 505            | —             | 505            | 712            | 1             | 713            | 946            | —             | 946            | 1,139          | —             | 1,139          |
| New Jersey     | 781            | 1             | 782            | 1,039          | 1             | 1,040          | 1,062          | 1             | 1,063          | 1,275          | —             | 1,275          |
| New Mexico     | 421            | 12            | 433            | 371            | 19            | 390            | 529            | 18            | 547            | 418            | 9             | 427            |
| New York       | 2,825          | 54            | 2,879          | 3,296          | 45            | 3,341          | 3,717          | 21            | 3,738          | 4,065          | 24            | 4,089          |
| North Carolina | 4,072          | 12            | 4,084          | 4,571          | 12            | 4,583          | 4,478          | 9             | 4,487          | 4,511          | 7             | 4,518          |
| North Dakota   | 1,354          | 491           | 1,845          | 1,112          | 457           | 1,569          | 917            | 351           | 1,268          | 892            | 292           | 1,184          |
| Ohio           | 3,475          | 128           | 3,603          | 3,887          | 108           | 3,995          | 4,537          | 56            | 4,593          | 4,364          | 67            | 4,431          |
| Oklahoma       | 2,557          | 218           | 2,775          | 2,364          | 213           | 2,577          | 2,203          | 167           | 2,370          | 1,899          | 82            | 1,981          |
| Oregon         | 1,601          | 56            | 1,657          | 1,705          | 41            | 1,746          | 1,606          | 36            | 1,642          | 1,699          | 24            | 1,723          |
| Pennsylvania   | 3,425          | 24            | 3,449          | 3,717          | 21            | 3,738          | 4,095          | 16            | 4,111          | 4,524          | 15            | 4,539          |
| Rhode Island   | 64             | —             | 64             | 85             | —             | 85             | 97             | —             | 97             | 117            | —             | 117            |
| South Carolina | 1,524          | 10            | 1,534          | 1,904          | 2             | 1,906          | 2,171          | 5             | 2,176          | 2,033          | 1             | 2,034          |
| South Dakota   | 1,230          | 221           | 1,451          | 1,060          | 169           | 1,229          | 809            | 158           | 967            | 934            | 149           | 1,083          |
| Tennessee      | 3,803          | 20            | 3,823          | 3,936          | 15            | 3,951          | 4,522          | 16            | 4,538          | 4,207          | 13            | 4,220          |
| Texas          | 13,786         | 308           | 14,094         | 12,338         | 226           | 12,564         | 13,252         | 192           | 13,444         | 9,849          | 77            | 9,926          |
| Utah           | 655            | 21            | 676            | 688            | 15            | 703            | 625            | 6             | 631            | 480            | 4             | 484            |
| Vermont        | 414            | 1             | 415            | 509            | 5             | 514            | 600            | 2             | 602            | 625            | —             | 625            |
| Virginia       | 2,677          | 6             | 2,683          | 2,736          | 5             | 2,741          | 3,253          | 5             | 3,258          | 3,309          | 6             | 3,315          |
| Washington     | 1,951          | 125           | 2,076          | 1,956          | 105           | 2,061          | 1,652          | 83            | 1,735          | 1,450          | 39            | 1,489          |
| West Virginia  | 480            | 1             | 481            | 525            | 1             | 526            | 685            | —             | 685            | 925            | 1             | 926            |
| Wisconsin      | 2,907          | 115           | 3,022          | 2,821          | 82            | 2,903          | 2,615          | 60            | 2,675          | 2,225          | 41            | 2,266          |
| Wyoming        | 277            | 25            | 302            | 302            | 26            | 328            | 168            | 18            | 186            | 149            | 7             | 156            |
| U.S. Govt.     | 4              | 1             | 5              | 530            | —             | 530            | 13             | —             | 13             | 29             | —             | 29             |
| Miscellaneous  | 605            | 3             | 608            | 590            | 3             | 593            | 306            | —             | 306            | 250            | —             | 250            |
| <b>TOTAL</b>   | <b>111,838</b> | <b>5,099</b>  | <b>116,937</b> | <b>113,759</b> | <b>3,975</b>  | <b>117,734</b> | <b>112,761</b> | <b>2,912</b>  | <b>115,673</b> | <b>106,758</b> | <b>2,037</b>  | <b>108,795</b> |

Source: Farm & Industrial Equipment Institute. Figures do not include garden tractors, motor tillers or contractor's off-highway types.

## Notebook (from pg. 8)

and you'll find some things that will interest you. If you don't, you're in another business and I don't know how you got hold of a copy of I&T.

Export and import numbers interest me a great deal. They show, for instance, how the world and our part of it changes in many ways. Sample: As recently as 1984, Nicaragua was importing over \$7 million in U.S. farm equipment. Today, according to Com-

merce Department data, it's zip. Not even on the computer. Libya took almost \$20 million in 1985, just over \$1 million last year and nothing so far this year.

However, most of the United States' declining track record in farm equipment exports is attributable to difficult times for agriculture throughout the world and the strength of the dollar. True, the dollar has declined substantially in the past two years, but it takes a long time to see such a change

reflected in exports of equipment.

Australia was a huge customer in 1984, buying \$214 million worth of farm machinery. But by last year, mainly because of Australia's farm economy problems, the level was down to \$47 million and probably will be lower at the end of this year.

And so as of June 30, 1987, the United States had exported \$802 million for the year, down \$34 million from the first half of 1986. Imports were \$916 million, up \$39 million

# Retail Sales of Selected Farm Equipment — Jan.-Dec., 1985 and 1986<sup>1</sup>

(In Units)

| STATE                            | COMBINES       |       | CORN HEADS |       | HAY BALERS <sup>2</sup> |       | WINDROWERS—<br>SELF-PROPELLED |       |                |       | GRINDER-<br>MIXERS |       | SHEAR-BAR<br>FORAGE<br>HARVESTERS <sup>3</sup> |       | MOWER<br>CONDI-<br>TIONERS<br>ALL-TYPES |        |
|----------------------------------|----------------|-------|------------|-------|-------------------------|-------|-------------------------------|-------|----------------|-------|--------------------|-------|------------------------------------------------|-------|-----------------------------------------|--------|
|                                  | SELF-PROPELLED |       | 1985       | 1986  | 1985                    | 1986  | POWER—<br>UNITS               |       | TOTAL<br>HEADS |       | 1985               | 1986  | 1985                                           | 1986  | 1985                                    | 1986   |
|                                  | 1985           | 1986  |            |       |                         |       | 1985                          | 1986  | 1985           | 1986  |                    |       |                                                |       |                                         |        |
| Alabama.....                     | 59             | 14    | 24         | 7     | 86                      | 78    | —                             | 2     | —              | 2     | 41                 | 28    | 11                                             | 6     | 88                                      | 108    |
| Alaska.....                      | —              | 1     | —          | —     | 7                       | —     | —                             | —     | —              | —     | —                  | —     | —                                              | —     | 5                                       | —      |
| Arizona.....                     | 26             | 13    | 1          | 1     | 27                      | 22    | 50                            | 30    | 55             | 35    | 1                  | 2     | 4                                              | 4     | 5                                       | 4      |
| Arkansas.....                    | 181            | 184   | 5          | 8     | 168                     | 110   | —                             | 2     | —              | 2     | 28                 | 10    | 2                                              | —     | 216                                     | 222    |
| California.....                  | 62             | 60    | 22         | 21    | 99                      | 85    | 178                           | 153   | 204            | 166   | 1                  | 1     | 45                                             | 52    | 30                                      | 54     |
| Colorado.....                    | 109            | 90    | 34         | 43    | 229                     | 141   | 103                           | 61    | 120            | 70    | 12                 | 9     | 21                                             | 12    | 110                                     | 80     |
| Connecticut.....                 | —              | —     | —          | —     | 26                      | 27    | —                             | —     | —              | —     | 1                  | —     | 19                                             | 17    | 48                                      | 57     |
| Delaware.....                    | 28             | 7     | 22         | 13    | 12                      | 6     | 1                             | —     | 1              | —     | 8                  | —     | 1                                              | 3     | 12                                      | 11     |
| Florida.....                     | 16             | 5     | 5          | 2     | 78                      | 62    | 1                             | —     | 2              | —     | 5                  | 3     | 17                                             | 6     | 54                                      | 54     |
| Georgia.....                     | 149            | 33    | 78         | 33    | 136                     | 100   | —                             | —     | —              | 1     | 39                 | 29    | 27                                             | 7     | 125                                     | 103    |
| Hawaii.....                      | —              | —     | —          | —     | —                       | —     | —                             | —     | —              | 1     | —                  | —     | —                                              | —     | —                                       | —      |
| Idaho.....                       | 112            | 71    | 3          | 1     | 200                     | 140   | 108                           | 73    | 139            | 93    | 3                  | —     | 14                                             | 7     | 60                                      | 50     |
| Illinois.....                    | 1,086          | 1,120 | 1,062      | 986   | 143                     | 105   | 3                             | 3     | 3              | 3     | 129                | 176   | 49                                             | 46    | 325                                     | 302    |
| Indiana.....                     | 613            | 602   | 650        | 526   | 166                     | 143   | 2                             | —     | 2              | 1     | 113                | 133   | 45                                             | 27    | 350                                     | 341    |
| Iowa.....                        | 635            | 854   | 640        | 819   | 80                      | 127   | 15                            | 30    | 16             | 29    | 180                | 295   | 46                                             | 67    | 252                                     | 429    |
| Kansas.....                      | 595            | 484   | 84         | 63    | 124                     | 73    | 124                           | 64    | 140            | 82    | 34                 | 35    | 36                                             | 19    | 263                                     | 124    |
| Kentucky.....                    | 109            | 63    | 89         | 40    | 201                     | 141   | —                             | —     | —              | —     | 78                 | 61    | 47                                             | 32    | 616                                     | 518    |
| Louisiana.....                   | 71             | 32    | 12         | 10    | 90                      | 58    | —                             | —     | —              | —     | 7                  | 4     | 6                                              | 5     | 38                                      | 47     |
| Maine.....                       | —              | —     | —          | —     | 53                      | 31    | 2                             | —     | 2              | —     | —                  | —     | 28                                             | 18    | 71                                      | 129    |
| Maryland.....                    | 90             | 53    | 82         | 49    | 83                      | 66    | 6                             | 6     | 6              | 6     | 22                 | 6     | 34                                             | 34    | 129                                     | 100    |
| Massachusetts.....               | —              | —     | —          | —     | 27                      | 31    | —                             | 1     | —              | 1     | —                  | —     | 28                                             | 15    | 68                                      | 55     |
| Michigan.....                    | 127            | 144   | 133        | 123   | 187                     | 197   | 24                            | 13    | 22             | 18    | 87                 | 77    | 132                                            | 112   | 329                                     | 363    |
| Minnesota.....                   | 417            | 462   | 268        | 295   | 214                     | 308   | 95                            | 56    | 101            | 65    | 97                 | 137   | 159                                            | 153   | 387                                     | 595    |
| Mississippi.....                 | 93             | 86    | 1          | —     | 47                      | 38    | —                             | —     | —              | —     | 19                 | 9     | 16                                             | 6     | 35                                      | 52     |
| Missouri.....                    | 397            | 397   | 157        | 173   | 255                     | 166   | 11                            | 8     | 12             | 10    | 71                 | 71    | 29                                             | 23    | 628                                     | 541    |
| Montana.....                     | 120            | 163   | 1          | —     | 88                      | 113   | 88                            | 94    | 115            | 119   | 17                 | 4     | 24                                             | 17    | 63                                      | 84     |
| Nebraska.....                    | 489            | 603   | 372        | 426   | 42                      | 43    | 45                            | 35    | 61             | 54    | 59                 | 80    | 37                                             | 65    | 131                                     | 223    |
| Nevada.....                      | 1              | —     | —          | —     | 26                      | 22    | 31                            | 20    | 37             | 26    | 2                  | —     | 10                                             | 3     | 14                                      | 13     |
| New Hampshire.....               | —              | —     | —          | —     | 40                      | 31    | —                             | —     | —              | —     | 1                  | —     | 15                                             | 16    | 57                                      | 107    |
| New Jersey.....                  | 6              | 4     | 8          | —     | 32                      | 25    | —                             | —     | —              | —     | 3                  | 9     | 4                                              | 8     | 43                                      | 21     |
| New Mexico.....                  | 23             | 10    | 2          | 4     | 124                     | 94    | 50                            | 26    | 52             | 28    | 2                  | 1     | 6                                              | 4     | 35                                      | 25     |
| New York.....                    | 35             | 29    | 51         | 36    | 391                     | 287   | 29                            | 14    | 25             | 17    | 35                 | 25    | 291                                            | 221   | 659                                     | 675    |
| North Carolina.....              | 127            | 98    | 117        | 107   | 155                     | 157   | —                             | —     | —              | —     | 26                 | 19    | 56                                             | 34    | 264                                     | 302    |
| North Dakota.....                | 459            | 433   | 31         | 20    | 9                       | 16    | 182                           | 95    | 198            | 130   | 51                 | 30    | 36                                             | 44    | 79                                      | 124    |
| Ohio.....                        | 438            | 479   | 369        | 364   | 307                     | 247   | 11                            | 13    | 11             | 13    | 118                | 129   | 100                                            | 84    | 646                                     | 480    |
| Oklahoma.....                    | 235            | 71    | 21         | 13    | 330                     | 110   | 69                            | 21    | 82             | 22    | 31                 | 11    | 10                                             | 4     | 450                                     | 229    |
| Oregon.....                      | 85             | 40    | 8          | 3     | 159                     | 143   | 94                            | 60    | 115            | 93    | 6                  | 2     | 21                                             | 16    | 95                                      | 92     |
| Pennsylvania.....                | 95             | 109   | 101        | 95    | 468                     | 352   | 26                            | 17    | 26             | 38    | 147                | 98    | 206                                            | 173   | 717                                     | 635    |
| Rhode Island.....                | —              | —     | —          | —     | 4                       | 2     | —                             | —     | —              | —     | —                  | —     | —                                              | —     | 2                                       | 2      |
| South Carolina.....              | 48             | 26    | 53         | 15    | 45                      | 41    | 1                             | —     | 1              | —     | 15                 | 7     | 12                                             | 4     | 78                                      | 86     |
| South Dakota.....                | 283            | 278   | 106        | 130   | 24                      | 34    | 98                            | 96    | 118            | 106   | 72                 | 79    | 59                                             | 63    | 44                                      | 181    |
| Tennessee.....                   | 114            | 53    | 28         | 22    | 198                     | 160   | —                             | —     | —              | —     | 93                 | 35    | 41                                             | 32    | 482                                     | 431    |
| Texas.....                       | 466            | 206   | 112        | 61    | 756                     | 396   | 55                            | 23    | 63             | 26    | 81                 | 53    | 30                                             | 21    | 1,142                                   | 611    |
| Utah.....                        | 18             | 7     | 3          | 1     | 137                     | 113   | 47                            | 51    | 52             | 54    | 4                  | 4     | 26                                             | 23    | 95                                      | 97     |
| Vermont.....                     | —              | 1     | —          | 1     | 58                      | 45    | 6                             | 2     | 7              | 3     | —                  | —     | 53                                             | 61    | 137                                     | 166    |
| Virginia.....                    | 72             | 30    | 51         | 23    | 141                     | 126   | 1                             | 2     | 1              | 2     | 39                 | 23    | 69                                             | 66    | 485                                     | 427    |
| Washington.....                  | 141            | 59    | 12         | 8     | 167                     | 158   | 61                            | 50    | 57             | 74    | -1                 | 4     | 40                                             | 17    | 95                                      | 82     |
| West Virginia.....               | —              | 1     | —          | 1     | 68                      | 59    | —                             | —     | —              | —     | 10                 | 9     | 17                                             | 14    | 114                                     | 87     |
| Wisconsin.....                   | 161            | 176   | 198        | 173   | 461                     | 632   | 66                            | 79    | 71             | 85    | 117                | 88    | 474                                            | 498   | 1,018                                   | 1,324  |
| Wyoming.....                     | 20             | 7     | —          | —     | 65                      | 67    | 35                            | 35    | 43             | 43    | 10                 | 1     | 5                                              | 4     | 30                                      | 31     |
| U.S. Govt.....                   | —              | —     | —          | —     | —                       | —     | —                             | —     | —              | —     | —                  | —     | —                                              | —     | —                                       | —      |
| Miscellaneous <sup>4</sup> ..... | —              | —     | —          | —     | 5                       | 6     | —                             | —     | —              | —     | —                  | —     | 2                                              | 1     | 24                                      | 24     |
| TOTAL.....                       | 8,411          | 7,660 | 5,016      | 4,716 | 7,038                   | 5,734 | 1,713                         | 1,255 | 1,961          | 1,518 | 1,914              | 1,797 | 2,460                                          | 2,164 | 11,243                                  | 10,898 |

Source: Farm & Industrial Equipment Institute.

<sup>1</sup>Includes revisions for prior months.

<sup>2</sup>For making bales of under 200 lbs.

<sup>3</sup>Pull-type, mounted, self-propelled.

<sup>4</sup>Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

from a year earlier. It's a negative farm equipment trade balance of \$114 million.

I think that the picture will improve in a few years, but the United States will probably not produce a favorable

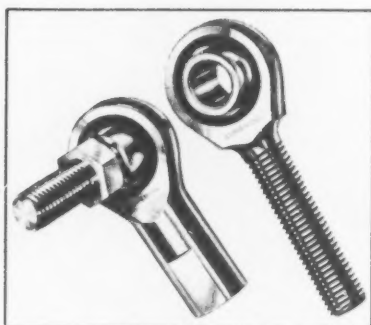
balance of farm equipment trade for the foreseeable future.

For one thing, the major manufacturers have committed themselves to supplying their U.S. markets with products to a large extent made in

Western Europe. They also are sourcing more components over there and thus cutting down their U.S. exports of tractor and equipment parts. They say that this is the most economical way to go.

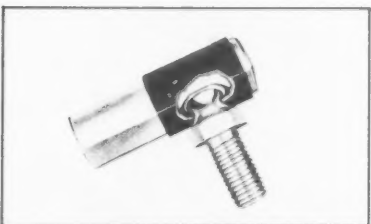
(advertisement)

## CONCEPTS IN MOTION TRANSMISSION



### High Wear-Resistance Rod Ends

Patented Superior process produces rod ends that provide high wear resistance in demanding applications . . . at a significant saving. Locks in lubricated raceways of fiberglass reinforced nylon, providing maximum contact with precision hardened steel balls, creating free movement with minimum play. Available in both male and female designs, left and right hand thread styles. Sizes from #10-32 through 3/4-16, with and without mounting studs. All units plated and dichromate treated for exceptional corrosion resistance. **Tuthill Corporation, Superior Linkage Division, 2110 Summit Street, New Haven, Indiana 46774.**



### Type SPG Ball Joints With Alignment Guide

Type SPC patented ball joint, designed for heavy duty service, has "flat top" alignment guide which makes it easy to align ball stud in vertical position to provide maximum movement in all directions, facilitates torquing of lock nuts. Ball joints swivel in 38° minimum cone. Thread sizes from #10-32 through 1/2-20. Includes Buna-N rubber dirt shield. Ball cavities packed with Lubriplate. Ball studs case hardened steel. Plated and dichromate treated for exceptional corrosion resistance. **Tuthill Corporation, Superior Linkage Division, 2110 Summit Street, New Haven, Indiana 46774.**

Write in (10) on Reply Card

## Value of U.S. Farm Equipment Exports by Countries of Destination

(Value in Thousands of Dollars)

| Country                                                              | 1984               | 1985               | 1986               | Jan.-June<br>1987 |
|----------------------------------------------------------------------|--------------------|--------------------|--------------------|-------------------|
| <b>Western Hemisphere</b>                                            |                    |                    |                    |                   |
| Canada .....                                                         | \$891,074          | \$791,762          | \$649,405          | \$384,078         |
| Mexico .....                                                         | 113,912            | 214,838            | 76,496             | 28,953            |
| Guatemala .....                                                      | 3,610              | 3,719              | 5,034              | 1,776             |
| Honduras .....                                                       | 5,890              | 3,884              | 3,486              | 1,986             |
| Nicaragua .....                                                      | 7,296              | 5,103              | —                  | —                 |
| El Salvador .....                                                    | 3,661              | 2,397              | 2,471              | 771               |
| Costa Rica .....                                                     | 6,306              | 5,073              | 3,718              | 1,453             |
| Panama .....                                                         | 2,704              | 3,396              | 5,057              | 3,343             |
| Trinidad .....                                                       | 2,544              | 2,410              | 1,979              | 931               |
| Dominican Republic .....                                             | 5,545              | 4,934              | 11,925             | 7,497             |
| Colombia .....                                                       | 16,191             | 11,989             | 12,349             | 8,469             |
| Jamaica .....                                                        | 4,398              | 3,210              | 2,537              | 1,430             |
| Venezuela .....                                                      | 23,904             | 43,193             | 54,116             | 18,639            |
| Brazil .....                                                         | 16,423             | 17,707             | 18,447             | 10,936            |
| Argentina .....                                                      | 10,136             | 5,283              | 4,695              | 11,977            |
| Bolivia .....                                                        | 3,636              | 3,382              | 3,127              | 1,489             |
| Chile .....                                                          | 5,581              | 7,385              | 5,638              | 3,211             |
| Ecuador .....                                                        | 6,858              | 11,056             | 11,044             | 3,861             |
| Peru .....                                                           | 7,052              | 4,079              | 6,131              | 2,488             |
| <b>Europe</b>                                                        |                    |                    |                    |                   |
| Denmark .....                                                        | 2,467              | 1,983              | 2,933              | 3,165             |
| Sweden .....                                                         | 9,066              | 3,445              | 3,366              | 3,954             |
| United Kingdom .....                                                 | 68,267             | 53,285             | 53,344             | 32,510            |
| Netherlands .....                                                    | 7,586              | 6,850              | 12,463             | 5,976             |
| Belgium .....                                                        | 53,832             | 23,595             | 40,770             | 24,306            |
| France .....                                                         | 89,374             | 60,232             | 68,371             | 50,117            |
| West Germany .....                                                   | 67,436             | 56,817             | 51,695             | 23,089            |
| Hungary .....                                                        | 10,955             | 12,741             | 13,151             | 4,195             |
| Switzerland .....                                                    | 3,204              | 2,441              | 2,701              | 1,443             |
| Spain .....                                                          | 10,986             | 9,760              | 20,838             | 7,150             |
| Italy .....                                                          | 8,610              | 7,572              | 13,150             | 6,764             |
| Yugoslavia .....                                                     | 1,532              | 2,893              | 2,924              | 922               |
| Greece .....                                                         | 22,295             | 18,094             | 5,045              | 1,121             |
| U.S.S.R. ....                                                        | 12,546             | 15,622             | 10,673             | 274               |
| <b>Middle East</b>                                                   |                    |                    |                    |                   |
| Israel .....                                                         | 16,958             | 13,844             | 7,459              | 3,881             |
| Kuwait .....                                                         | 1,691              | 3,099              | 2,681              | 920               |
| Saudi Arabia .....                                                   | 257,307            | 96,269             | 73,559             | 39,432            |
| Iraq .....                                                           | 2,136              | 5,321              | 2,170              | 110               |
| Turkey .....                                                         | NA                 | NA                 | 3,534              | 3,052             |
| <b>Asia and Pacific</b>                                              |                    |                    |                    |                   |
| India .....                                                          | 2,959              | 801                | 1,774              | 743               |
| Singapore .....                                                      | 13,100             | 4,315              | 5,264              | 3,770             |
| Indonesia .....                                                      | 3,795              | 936                | 1,754              | 789               |
| China (Taiwan) .....                                                 | 2,296              | 2,635              | 2,727              | 1,698             |
| China (P.R.C.) .....                                                 | 16,894             | 6,545              | 11,950             | 2,805             |
| Philippines .....                                                    | 4,045              | 1,967              | 2,297              | 1,221             |
| Korea .....                                                          | 5,236              | 3,294              | 2,706              | 1,813             |
| Japan .....                                                          | 20,196             | 17,458             | 18,876             | 11,072            |
| Australia .....                                                      | 214,075            | 141,506            | 47,670             | 18,990            |
| New Zealand .....                                                    | 5,293              | 3,723              | 2,706              | 773               |
| <b>Africa</b>                                                        |                    |                    |                    |                   |
| Algeria .....                                                        | 5,133              | 4,418              | 6,168              | 2,842             |
| Libya .....                                                          | 19,687             | 14,819             | 1,196              | —                 |
| Sudan .....                                                          | 4,498              | 2,163              | 3,811              | 2,787             |
| Nigeria .....                                                        | 2,538              | 5,856              | 5,967              | 1,682             |
| Egypt .....                                                          | 11,436             | 22,510             | 15,876             | 3,725             |
| Rep. South Africa .....                                              | 59,537             | 29,370             | 25,011             | 12,515            |
| Zimbabwe .....                                                       | 1,643              | 2,904              | 1,181              | 592               |
| <b>Total U.S. Exports, Farm &amp;<br/>Industrial Equipment .....</b> | <b>\$2,235,014</b> | <b>\$1,854,772</b> | <b>\$1,466,690</b> | <b>\$801,683</b>  |

Source: U.S. Dept. of Commerce, International Trade Admin., Office of Capital Goods and International Construction.

## Farm Equipment Exports by Type of Product

| Product                                                  | Jan.-Dec. 1985 |                           | Jan.-Dec. 1986 |                           | Jan.-June 1987 |                           |
|----------------------------------------------------------|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|
|                                                          | Quantity       | Dollar Value in Thousands | Quantity       | Dollar Value in Thousands | Quantity       | Dollar Value in Thousands |
| Combines, pull-type.....                                 | 829            | \$13,423                  | 1,208          | 25,192                    | 1,179          | 25,475                    |
| Combines, self-propelled.....                            | 3,942          | 170,229                   | 3,729          | 126,771                   | 2,215          | 84,233                    |
| Cultivators, tractor-drawn or mounted.....               | 2,177          | 5,876                     | 1,323          | 2,972                     | 551            | 1,475                     |
| Cultivators, NEC, and Weeders.....                       | 3,571          | 6,052                     | 1,254          | 3,504                     | 2,066          | 2,420                     |
| Farm Elevators and Blowers.....                          | 1,766          | 5,770                     | 1,877          | 3,847                     | 721            | 1,632                     |
| Farm Wagons and Carts.....                               | 833            | 2,021                     | 1,877          | 3,847                     | 466            | 927                       |
| Parts for Farm Wagons and Carts.....                     | —              | 897                       | —              | 701                       | —              | 393                       |
| Fertilizing Machines.....                                | 4,580          | 13,820                    | 6,375          | 13,831                    | 2,355          | 4,073                     |
| Forage Harvesters.....                                   | 1,655          | 19,861                    | 1,125          | 20,863                    | 568            | 12,694                    |
| Harrows, Disk.....                                       | 1,681          | 7,768                     | 866            | 3,111                     | 491            | 1,667                     |
| Harrows, NEC, & Soil Pulverizers.....                    | 4,266          | 4,764                     | 3,014          | 3,505                     | 2,066          | 2,686                     |
| Parts for Harrows, Stalk Cutters & Soil Pulverizers..... | —              | 9,292                     | —              | 3,745                     | —              | 2,436                     |
| Harvesting Machines, NEC.....                            | 5,329          | 75,125                    | 3,858          | 43,489                    | 2,395          | 16,864                    |
| Harvesting Machine Parts.....                            | —              | 129,487                   | —              | 123,102                   | —              | 62,441                    |
| Hay Balers.....                                          | 4,387          | 32,563                    | 4,311          | 31,340                    | 3,477          | 26,446                    |
| Haying Machines, NEC (incl. rakes & tedders).....        | 2,722          | 17,083                    | 2,121          | 14,367                    | 1,228          | 8,682                     |
| Parts for Haying Machines.....                           | —              | 14,845                    | —              | 12,766                    | —              | 9,098                     |
| Mowers, Cutterbar, tractor-drawn.....                    | 1,400          | 2,895                     | 1,475          | 3,138                     | 383            | 1,637                     |
| Mowers, Rotary, tractor-drawn (excl. lawn mowers).....   | 7,481          | 5,691                     | 9,395          | 6,210                     | 8,270          | 4,346                     |
| Mowers, NEC, tractor-drawn (excl. lawn mowers).....      | 2,372          | 6,647                     | 1,686          | 5,188                     | 768            | 4,322                     |
| Planting Machines.....                                   | 3,340          | 7,816                     | 1,799          | 7,342                     | 1,264          | 4,855                     |
| Plows, Disk.....                                         | 853            | 2,357                     | 672            | 1,418                     | 325            | 739                       |
| Plows, Moldboard.....                                    | 1,654          | 5,351                     | 480            | 1,765                     | 579            | 1,754                     |
| Plows & Listers, NEC.....                                | 3,272          | 9,055                     | 2,486          | 6,627                     | 2,323          | 3,084                     |
| Parts for Plows, Listers, Cultivators & Weeders.....     | —              | 9,184                     | —              | 8,118                     | —              | 5,827                     |
| Seeding Machines.....                                    | 8,599          | 18,709                    | 7,267          | 14,862                    | 3,264          | 6,778                     |
| Parts for Planting, Seeding & Fertilizing Machines.....  | —              | 13,479                    | —              | 11,888                    | —              | 4,466                     |
| Farm Tractors:                                           |                |                           |                |                           |                |                           |
| Under 40 PTO HP.....                                     | 669            | 3,521                     | 841            | 4,403                     | 436            | 2,381                     |
| 40-59 PTO HP.....                                        | 798            | 8,536                     | 570            | 5,682                     | 284            | 2,829                     |
| 60-79 PTO HP.....                                        | 818            | 12,279                    | 453            | 6,815                     | 149            | 2,046                     |
| 80-99 PTO HP.....                                        | 1,164          | 23,580                    | 490            | 9,913                     | 263            | 6,249                     |
| 100-119 PTO HP.....                                      | 760            | 22,200                    | 536            | 18,136                    | 126            | 4,250                     |
| 120-139 PTO HP.....                                      | 1,741          | 60,801                    | 849            | 29,213                    | 293            | 10,936                    |
| 140-159 PTO HP.....                                      | 1,264          | 47,619                    | 751            | 27,120                    | 163            | 5,683                     |
| 160-179 PTO HP.....                                      | 1,409          | 63,625                    | 1,072          | 45,451                    | 472            | 22,720                    |
| 180 HP & Over.....                                       | 1,793          | 119,052                   | 1,175          | 75,166                    | 499            | 30,994                    |
| Other Farm Tractors.....                                 | 1,157          | 23,815                    | 1,525          | 21,961                    | 1,752          | 13,069                    |
| Parts for Farm Tractors.....                             | —              | 566,941                   | —              | 454,098                   | —              | 259,208                   |

Source: U.S. Dept. of Commerce, International Trade Admin., Office of Capital Goods and International Construction.  
 NEC — Not elsewhere counted or classified.

### FOR YOUR INFORMATION

**Marathon Electric Mfg. Corp.** has a brochure describing its electrical motors for agricultural applications. Single-phase motors described include chore motors, drip proof crop dryer motors, fan motors for high-pressure grain drying and vacuum pump motors. A Marathon innovation, PowerSwitch, which provides extra starting power for single phase motors, is also described. Marathon Electric

Mfg. Corp., Lead Inquiry Services, Box 633, Elm Grove, Wis. 53122.

\*\*\*  
**OMC Lincoln Service Dept.** has produced the "Cushman Tune-Up Book" which covers OMC 18-22 hp gas engines used in the Cushman Front Line mower, the Turf-Truckster vehicle and the Haulster vehicle. Service Dept., OMC Lincoln, P.O. Box 82409, Lincoln, Neb. 68501.

**Homestead Industries, Inc.** has an eight-page brochure listing its line of Jenny hot and cold pressure washers, steam cleaners and combination units. Homestead Industries, Inc., P.O. Box 348, Coraopolis, Pa. 15108.

\*\*\*  
**Homelite Div. of Textron, Inc.**, has a 52-page industrial products catalog that covers its water pumps, generators, chain saws, brushcutters, snow throwers, commercial mowers and tractors. Sales Dept., Homelite Div. of Textron, Inc., Box 7047, Charlotte, N.C. 28217.

**Shindaiwa Inc.** describes in a 16-page booklet its complete line of outdoor power equipment, including chain saws, grass trimmers, brushcutters, pumps, blowers and generators. Ask for catalog 50241-6. Shindaiwa, Inc., Box 1090, Tualatin, Ore. 97062.

\*\*\*  
**Rust-Oleum Corp.** describes in a new bulletin its 78.5 Rust Reformer coating, which it claims transforms rust into an inert, non-corrosive black coating. John Ernst, Rust-Oleum Corp., 11 Hawthorn Parkway, Vernon Hills, Ill. 60061.

## Dollar Value of Farm Equipment Imports by Country of Origin, Jan. 1982-June 1987

(In Thousands)

| Country        | Jan.-Dec.<br>1982  | Jan.-Dec.<br>1983  | Jan.-Dec.<br>1984  | Jan.-Dec.<br>1985  | Jan.-Dec.<br>1986  | Jan.-June<br>1987 |
|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|
| Canada         | \$487,286          | \$453,551          | \$576,583          | \$415,527          | \$366,074          | \$227,144         |
| Mexico         | 11,349             | 18,563             | 10,099             | 8,159              | 6,218              | 6,036             |
| Brazil         | 4,780              | 6,424              | 11,395             | 12,214             | 10,967             | 7,942             |
| Sweden         | 3,023              | 2,873              | 4,002              | 3,464              | 4,538              | 2,997             |
| Denmark        | 4,910              | 5,856              | 7,670              | 9,331              | 7,290              | 4,629             |
| Netherlands    | 13,924             | 32,831             | 46,912             | 33,945             | 29,778             | 15,356            |
| United Kingdom | 93,806             | 163,678            | 217,201            | 207,020            | 234,406            | 111,752           |
| Belgium        | 25,730             | 23,691             | 27,697             | 29,389             | 42,537             | 26,555            |
| France         | 30,804             | 41,333             | 72,605             | 68,681             | 64,556             | 32,084            |
| West Germany   | 169,087            | 248,015            | 223,651            | 222,756            | 252,740            | 128,920           |
| Hungary        | 7,564              | 2,404              | 11,665             | 5,444              | 1,816              | 1,981             |
| Czechoslovakia | 1,113              | 1,892              | 5,888              | 5,926              | 6,197              | 1,344             |
| Romania        | 15,461             | 6,088              | 4,701              | 4,409              | 1,921              | 3,779             |
| Italy          | 95,092             | 99,219             | 152,409            | 122,300            | 118,808            | 66,602            |
| Spain          | 6,541              | 2,946              | 7,124              | 3,996              | 5,978              | 3,115             |
| Israel         | 2,677              | 2,988              | 4,183              | 7,619              | 7,475              | 4,552             |
| New Zealand    | 9,792              | 11,885             | 11,220             | 10,725             | 8,123              | 5,138             |
| Australia      | 4,662              | 3,209              | 4,568              | 5,421              | 5,941              | 2,774             |
| Japan          | 181,056            | 204,818            | 309,757            | 355,577            | 418,780            | 238,599           |
| China (Taiwan) | 2,913              | 3,617              | 5,175              | 5,132              | 6,066              | 3,307             |
| China (P.R.C.) | 1,381              | 1,949              | 3,113              | 2,568              | 3,002              | 2,663             |
| Korea          | NA                 | 852                | 742                | 1,256              | 5,667              | 4,787             |
| U.S.S.R.       | NA                 | 1,255              | 852                | 1,266              | 3,731              | 716               |
| <b>TOTAL</b>   | <b>\$1,179,734</b> | <b>\$1,347,483</b> | <b>\$1,729,402</b> | <b>\$1,557,623</b> | <b>\$1,630,628</b> | <b>\$916,352</b>  |

Source: U.S. Dept. of Commerce, International Trade Administration, Office of Capital Goods and International Construction.

## Imports of Farm Equipment by Product

| Product                                                           | Jan.-Dec. 1985 |                                     | Jan.-Dec. 1986 |                                     | Jan.-June 1987 |                                     |
|-------------------------------------------------------------------|----------------|-------------------------------------|----------------|-------------------------------------|----------------|-------------------------------------|
|                                                                   | Quantity       | Value in<br>Thousands<br>of Dollars | Quantity       | Value in<br>Thousands<br>of Dollars | Quantity       | Value in<br>Thousands<br>of Dollars |
| Knives & Cutting Blades                                           | 11,710,518     | \$ 10,240                           | 8,741,126      | \$ 8,202                            | 4,780,233      | \$ 4,905                            |
| Plows & Listers                                                   | 2,555          | 2,700                               | 3,363          | 7,962                               | 2,613          | 6,486                               |
| Cultivators & Weeders                                             | 19,075         | 14,198                              | 32,017         | 25,127                              | 13,448         | 14,188                              |
| Parts of Plows, Cultivators,<br>Weeders & Listers                 | —              | 29,840                              | —              | 23,536                              | —              | 14,801                              |
| Harrows, Rollers, Stalk<br>Cutters, Soil Pulverizers              | 32,375         | 10,844                              | 32,442         | 16,987                              | 15,023         | 13,216                              |
| Parts of Harrows, Rollers,<br>Stalk Cutters, etc.                 | —              | 13,531                              | —              | 12,157                              | —              | 11,394                              |
| Planting, Seeding &<br>Fertilizing Machinery                      | 39,976         | 23,633                              | 30,288         | 24,074                              | 17,323         | 14,797                              |
| Parts of Planting, Seeding<br>& Fertilizing Machinery             | —              | 9,101                               | —              | 9,858                               | —              | 6,419                               |
| Haying Machinery other<br>than Mowers                             | 7,661          | 10,426                              | 5,347          | 10,588                              | 4,686          | 6,357                               |
| Mowers except Lawn Mowers                                         | 17,140         | 29,906                              | 19,060         | 30,191                              | 12,778         | 20,710                              |
| Harvesting Machines, NES                                          | 10,312         | 75,217                              | 6,858          | 47,808                              | 3,788          | 28,755                              |
| Parts of Harvesting Machines                                      | —              | 56,216                              | —              | 57,807                              | —              | 30,636                              |
| Farm Wagons & Carts                                               | 4,571          | 4,368                               | 3,455          | 3,345                               | 2,368          | 2,314                               |
| Agricultural Machines &<br>Implements, NES                        | —              | 131,945                             | —              | 143,876                             | —              | 80,943                              |
| Parts of Agricultural<br>Machines, NES                            | —              | 78,377                              | —              | 82,488                              | —              | 64,328                              |
| Tractors, Agricultural, Wheel-Type,<br>New, excluding Industrial* | 126,959        | 718,163                             | 127,964        | 807,047                             | 76,070         | 421,680                             |
| Tractors, Agri., Used                                             | 6,605          | 41,883                              | 4,110          | 28,367                              | 2,232          | 13,976                              |
| Parts for Agri. Tractors                                          | —              | 285,290                             | —              | 278,482                             | —              | 150,402                             |
| Walk-Behind Rotary Tillers                                        | 3,889          | 1,765                               | 16,035         | 2,470                               | 9,178          | 2,428                               |

Source: U.S. Dept. of Commerce, International Trade Administration, Office of Capital Goods and International Construction.

NES - Not elsewhere specified.

\*Use of the term "industrial" here is understood to refer to such machines as forklifts but not to industrial tractors as commonly defined in the farm and industrial equipment industry.

## New Agricultural Tractor Imports, Jan. 1984-June 1987

(In Units)

|                       | Under<br>40 HP* | 40-79<br>HP*  | 80-99<br>HP* | 100HP<br>and Over* | HP Not<br>Specifically<br>Provided* | Not Elsewhere<br>Specified, Ex-<br>cluding In-<br>dustrial, In-<br>cluding Gar-<br>den Types** | Totals         |
|-----------------------|-----------------|---------------|--------------|--------------------|-------------------------------------|------------------------------------------------------------------------------------------------|----------------|
| <b>Jan.-June 1987</b> |                 |               |              |                    |                                     |                                                                                                |                |
| Belgium .....         | —               | 71            | —            | 400                | —                                   | 2                                                                                              | 473            |
| Canada .....          | 48              | 7             | 51           | 649                | 24                                  | 101                                                                                            | 880            |
| Czechoslovakia ..     | —               | —             | —            | 1                  | 275                                 | —                                                                                              | 276            |
| France .....          | 8               | 25            | 68           | 1                  | 6                                   | 11                                                                                             | 119            |
| Italy .....           | 19              | 62            | —            | —                  | 13                                  | 2,846                                                                                          | 2,940          |
| Japan .....           | 32,466          | 4,575         | 1            | 53                 | 463                                 | 16,013                                                                                         | 53,571         |
| Korea .....           | 415             | —             | —            | —                  | —                                   | 116                                                                                            | 531            |
| Romania .....         | 114             | 913           | —            | —                  | —                                   | 1                                                                                              | 1,028          |
| U.S.S.R. ....         | 166             | 59            | 14           | —                  | —                                   | —                                                                                              | 239            |
| United Kingdom ..     | 2,274           | 7,161         | 680          | 171                | 70                                  | 68                                                                                             | 10,424         |
| West Germany...       | 464             | 3,001         | 279          | 44                 | 7                                   | 603                                                                                            | 4,398          |
| Yugoslavia .....      | 149             | 342           | —            | —                  | —                                   | 165                                                                                            | 656            |
| <b>Totals .....</b>   | <b>36,242</b>   | <b>16,429</b> | <b>1,097</b> | <b>1,343</b>       | <b>867</b>                          | <b>20,087</b>                                                                                  | <b>76,070</b>  |
| <b>1986</b>           |                 |               |              |                    |                                     |                                                                                                |                |
| Belgium .....         | 26              | 67            | 29           | 543                | —                                   | 2                                                                                              | 667            |
| Canada .....          | 134             | 41            | 57           | 728                | 35                                  | 542                                                                                            | 1,537          |
| Czechoslovakia ..     | —               | 306           | —            | —                  | 541                                 | 44                                                                                             | 891            |
| France .....          | 27              | 85            | 60           | 191                | 2                                   | 19                                                                                             | 384            |
| Italy .....           | 102             | 1,189         | 113          | 41                 | 5                                   | 3,849                                                                                          | 5,299          |
| Japan .....           | 52,000          | 15,282        | 134          | 1,850              | 679                                 | 12,648                                                                                         | 82,593         |
| Korea .....           | 527             | 8             | —            | —                  | —                                   | —                                                                                              | 535            |
| Romania .....         | 29              | 321           | —            | —                  | 145                                 | —                                                                                              | 495            |
| U.S.S.R. ....         | 626             | 463           | 114          | 10                 | —                                   | 1                                                                                              | 1,214          |
| United Kingdom ..     | 4,846           | 16,396        | 1,387        | 21                 | 216                                 | 214                                                                                            | 23,080         |
| West Germany...       | 266             | 8,417         | 1,220        | 80                 | 30                                  | 225                                                                                            | 10,238         |
| Yugoslavia .....      | 6               | 195           | —            | —                  | —                                   | 3                                                                                              | 204            |
| <b>Totals .....</b>   | <b>58,746</b>   | <b>43,121</b> | <b>3,182</b> | <b>3,475</b>       | <b>1,663</b>                        | <b>17,777</b>                                                                                  | <b>127,964</b> |
| <b>1985</b>           |                 |               |              |                    |                                     |                                                                                                |                |
| Canada .....          | 118             | 66            | 94           | 637                | 786                                 | 589                                                                                            | 2,290          |
| France .....          | 138             | 360           | 193          | 255                | 4                                   | 42                                                                                             | 992            |
| Italy .....           | 267             | 1,501         | 143          | 205                | 20                                  | 1,105                                                                                          | 3,241          |
| Japan .....           | 58,807          | 13,306        | 75           | 76                 | 233                                 | 16,331                                                                                         | 88,828         |
| United Kingdom ..     | 5,362           | 11,028        | 1,220        | 565                | 101                                 | 137                                                                                            | 18,413         |
| West Germany...       | 999             | 6,639         | 1,513        | 473                | 119                                 | 140                                                                                            | 9,883          |
| <b>Totals .....</b>   | <b>66,600</b>   | <b>34,392</b> | <b>3,318</b> | <b>2,301</b>       | <b>1,830</b>                        | <b>18,518</b>                                                                                  | <b>126,959</b> |
| <b>1984</b>           |                 |               |              |                    |                                     |                                                                                                |                |
| Canada .....          | 56              | 74            | 145          | 899                | 1,539                               | 985                                                                                            | 3,698          |
| France .....          | 2               | 213           | 223          | 755                | 5                                   | 74                                                                                             | 1,272          |
| Italy .....           | 141             | 1,836         | 432          | 329                | 1                                   | 496                                                                                            | 3,235          |
| Japan .....           | 50,723          | 9,347         | 192          | 122                | 298                                 | 18,591                                                                                         | 79,273         |
| United Kingdom ..     | 4,955           | 16,166        | 2,304        | 1,498              | 72                                  | 330                                                                                            | 25,325         |
| West Germany...       | 124             | 5,333         | 2,113        | 537                | 18                                  | 46                                                                                             | 8,171          |
| <b>Totals .....</b>   | <b>56,782</b>   | <b>35,428</b> | <b>5,626</b> | <b>4,195</b>       | <b>2,207</b>                        | <b>20,642</b>                                                                                  | <b>124,880</b> |

Others in 1985: Czechoslovakia - 591; U.S.S.R. - 406; Netherlands - 389; Belgium - 157.

Source: U.S. Dept. of Commerce, International Trade Admin., Office of Capital Goods and International Construction.

\*Excluding garden tractors. \*\*Including garden tractors and rototillers.

## CHANGES

**Farm Fans, Inc.**, Indianapolis, Ind., has named Larry P. McFarland as director of North American sales. He was previously manager, sales planning and development.

\*\*\*

**Herbert P. Culp**, president and owner of Friend Mfg. Corp., Gasport, N.Y., died Sept. 1 at Buffalo, N.Y. His company manufactures sprayers.

\*\*\*

**Gandy Co.**, Owatonna, Minn., has named Mike Hohn as eastern regional sales manager and Jeff Miedema as western sales manager. Both report to Robert L. Aamlid, national product manager.

\*\*\*

**Perkins North America** is relocating its headquarters from Wayne, Mich., to Lawrenceville, Ga., an Atlanta suburb. The 130,000-square-foot facility will accommodate sales, marketing, research and product development, service and other operations.

\*\*\*

**Robert J. Hill** is new product manager for tractors at Kubota Tractor Corp., Compton, Calif., responsible for managing sales and marketing activities for the tractor line. He was formerly with Deutz-Allis Corp.

\*\*\*

**Vaporomatic Co. Ltd.**, Sowton, Exeter, U.K., has named Martin Mountstevens as worldwide sales manager. The company markets tractor replacement parts.

\*\*\*

**Briggs & Stratton Corp.**, Milwaukee, Wis., has completed production of its one-millionth twin cylinder air-cooled engine.

\*\*\*

**Gene Hemphill** is new manager of North American public affairs for Ford New Holland, Inc., reporting to John Ochs, director of public affairs.

\*\*\*

**Tom Stadtmueller**, Deutz-Allis marketing manager for Gleaner combines, has taken on the added duties of implementation and hay tool marketing manager. He remains at the Gleaner Works in Independence, Mo.

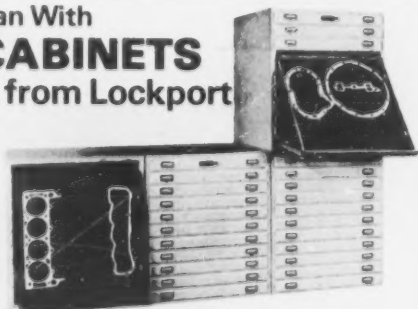
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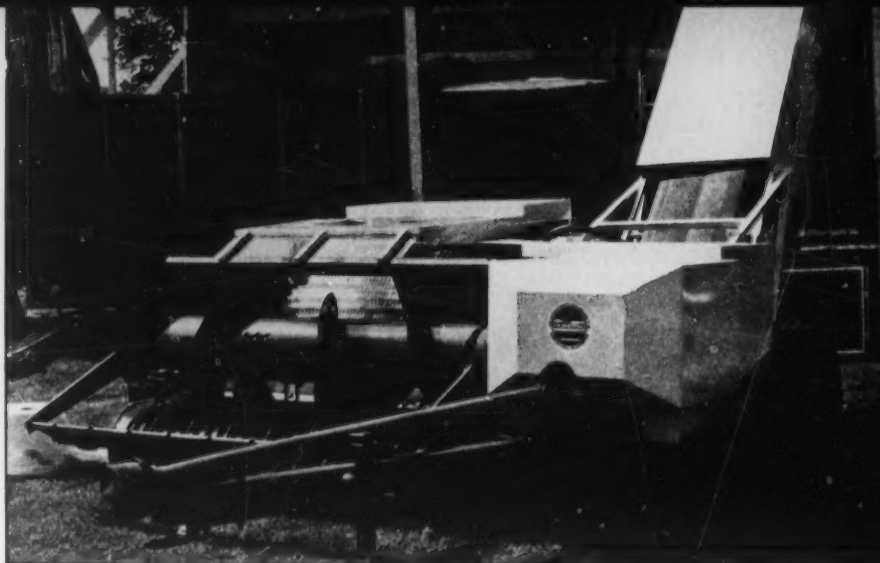
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PROTOTYPE forage harvester, designed to give high output from a 60-hp tractor, was shown by Agriculture and Food Research Council. Since much of the power used by conventional forage harvesters is in the cutting mechanism, this power-saving unit feeds material to a row of circular knives which have adjustable spacing to control length of cut. Field studies have shown reduction of power requirements by up to 40 percent. A high-speed moving belt elevator rather than a blower carries chopped material into a trailer.



## U.K.'s Royal: Bright Ideas for a Gloomy Market

By Michael Williams

**T**HE 1987 Royal Show, Britain's summer farm equipment showcase, opened to the accompaniment of gloomy statistics from the tractor industry. Sales in the first half of the year were 9,443 units, down 12 percent. Market share data from the Ag-

ricultural Engineers Assn. shows that Ford is the top-selling make in Britain, for the 13th straight year, followed by Case IH, which has pushed past Massey-Ferguson. John Deere is fourth. Between them the big four have 75 percent of the market, leaving the other 25 or so makes to fight for the rest of it.

In the face of this, at least three imports have pulled out — Switzerland's Hurlimann, part of the Italian SAME group; Poland's Ursus range; and Yugoslavia's Torpedo, based on a Deutz design.

But even down markets have up spots. One is equipment for use with all-terrain vehicles: Sprayers, fertilizer spreaders, trailers and grass cutters, for example.

And down markets often present new approaches. One seen at the Royal was a build-it-yourself manure spreader range that saves the buyer about \$800 if he takes a kit of parts on a pallet.

Another idea shown was a pro-

totype forage harvester developed by the Engineering Centre of the Agriculture and Food Research Council at Silsoe, Bedford, designed to cut the power needed to cut grass.



**SANDERSON TELEPORTER 2 11-30** features a hydraulic ram over the front axle that levels that machine up to 12 degrees either way over uneven ground. Four-wheel drive is standard. The three-stage lifting arm will raise three tons 11 meters. No list price.

### Tractor Market Shares in Britain

| Make            | 1987<br>(Jan-June) | 1986 |
|-----------------|--------------------|------|
| Ford            | 25.0               | 24.4 |
| Massey-Ferguson | 16.6               | 20.1 |
| Case-IH         | 22.4               | 18.4 |
| John Deere      | 13.7               | 13.3 |
| Deutz           | 2.9                | 3.6  |
| Renault         | 2.4                | 3.6  |
| Fiat            | 2.3                | 2.9  |
| SAME            | 1.2                | 1.7  |
| Mercedes-Benz   | 0.8                | 1.1  |
| Others          | 12.6               | 10.9 |

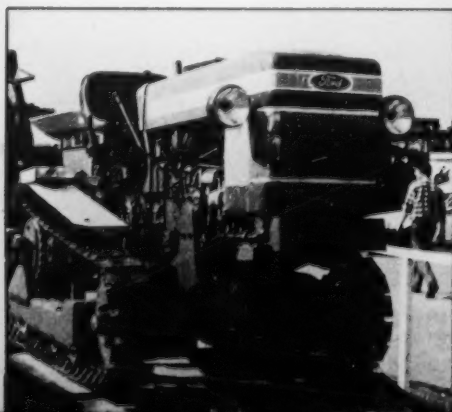


**Above left:** AN ALL-WEATHER CAB for all-terrain vehicles, offered by Logic, is priced at \$832 (wiper extra). It is not designed to give rollover protection. **Right:** MARSHALL, the British tractor maker acquired by Bentall-Simplex last year, is offering compacts. The 184 (18 hp) sells for \$7,500 and the 264 (26 hp) for \$8,128. Both have Ruggerini diesel engines.



**Above left:** CHAVIOT 931 can carry a 2500-liter sprayer or 2.5-ton fertilizer spreader. Driven by an 85-hp diesel, it comes with a 12-meter boom (at \$39,200) or an optional 24-meter boom. **Center:** MARTIN MARKHAM tank-type manure spreader comes as a build-it-yourself kit on pallet. Kit price is listed at \$2,080; complete, it's \$2,880. **Right:** KUBOTA showed this L2850 with a reversible driving seat, steering and foot controls. Hand controls are positioned at the side and are accessible both ways. List price not yet available.

**Below:** INTERMEC designed this crawler conversion of a Ford 1210 compact, made by Shibauro. Tracks are 170 or 300 mm wide; conversion price is \$4,800 or \$5,600, depending on tracks. **Right:** FARMKING tractor by Quintade, aimed at export markets, has a 22.5-hp Lister diesel engine and a three-speed gearbox that develops a road speed of 16.5 mph. Export list price: \$7,970.



## August Sales: More Big Tractor Increases

Sales of big, two-wheel-drive tractors took another jump in August, according to the flash report of the Farm & Industrial Equipment Institute. It was the second straight rise, after very slow movement in the first six months of 1987. Much of the increase is believed to come from Case IH's efforts to clear out old inventory of over-100-hp, two-wheel-drive units. The company will begin producing its Magnum line (130-195 hp) in November.

| Equipment                          | Unit Retail Sales |       |          | January-August |        |          |
|------------------------------------|-------------------|-------|----------|----------------|--------|----------|
|                                    | 1987              | 1986  | % Change | 1987           | 1986   | % Change |
| Farm Wheel Tractors:               |                   |       |          |                |        |          |
| 2-Wheel Drive                      |                   |       |          |                |        |          |
| Under 40 hp                        | 4,367             | 4,346 | .5       | 43,850         | 44,791 | (2.1)    |
| 40 & Under 100 hp                  | 2,202             | 2,194 | .4       | 20,049         | 20,735 | (3.3)    |
| 100 & Under 140 hp                 | 907               | 205   | 342.4    | 2,846          | 3,608  | (21.2)   |
| 140 hp & Over                      | 2,054             | 232   | 785.3    | 5,754          | 6,563  | (12.3)   |
| Total 2-Wheel Drive                | 9,530             | 6,977 | 36.6     | 72,499         | 75,697 | (4.2)    |
| 4-Wheel Drive                      |                   |       |          |                |        |          |
| Under 200 hp                       | 22                | 13    | 69.2     | 304            | 357    | (14.8)   |
| 200 hp & Over                      | 66                | 54    | 22.2     | 556            | 841    | (33.9)   |
| Total 4-Wheel Drive                | 88                | 67    | 31.3     | 860            | 1,198  | (28.2)   |
| Total Farm Wheel Tractors          | 9,618             | 7,044 | 36.5     | 73,359         | 76,895 | (4.6)    |
| Combines (Self-Propelled)          | 741               | 1,657 | (55.3)   | 2,498          | 4,196  | (40.5)   |
| Balers (Bales under 200 lbs)       | 585               | 756   | (22.6)   | 4,306          | 4,477  | (3.8)    |
| Forage Harvesters (Shear Bar Type) | 235               | 212   | 10.8     | 1,329          | 1,116  | 19.1     |
| Mower Conditioners                 | 954               | 1,101 | (13.4)   | 8,927          | 8,241  | 8.3      |

These data are, in part, estimates which are subject to revisions when final detail data become available. Because of the seasonal nature of the industry, comparisons of monthly data from one period to another should be done with extreme caution. These data represent most, but not all of the manufacturers in each product category being sold at retail in the 50 states and the District of Columbia.

## Mahindra Setting Up Network To Import Tractor

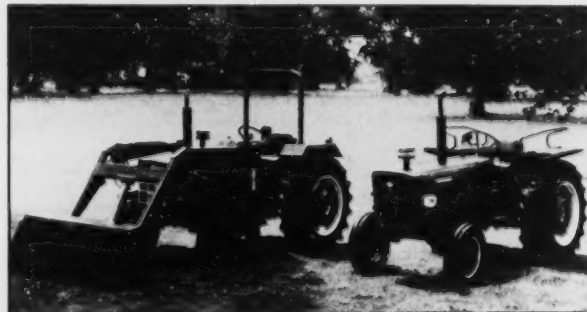
Mahindra Equipment Corp. has opened its North American office in Houston, Texas, and is in the process of establishing a nationwide dealer network to sell and service low-priced Mahindra

tractors imported from India.

Mahindra made tractors for International Harvester in India until Case bought out IH. Now Mahindra Equipment Corp. is market-

ing three models under its own name in the United States and Canada.

The Mahindra tractors are available in 35 hp for less than \$7,600, 45 hp for less than \$8,000, and 50 hp for less than \$8,400.



## Briefly...

A proposed merger between the Construction Industry Manufacturers Assn. and the Farm & Industrial Equipment Institute has been voted down by CIMA's board. Talks and committee work had been going on for two years.

## Case-Hesston Venture: Miller Is Manager

Charles H. Miller is general manager of the newly formed hay tool manufacturing joint venture of Case IH and Hesston Corp. A production executive for Case since 1970, he will be responsible for manufacturing operations at the Hesston, Kan., plant.

Jerome Green, Case president, said at an Aug. 28 press conference that Case has an option to increase its ownership of the joint venture "based on our take," to as much as full ownership.

## Hesston: Losses Down, Volume Improved

For the first half of fiscal 1987, ended June 30, Hesston sales rose to \$69.3 million from \$54.3 million a year earlier, while losses declined from \$23 million to \$20.3 million. In the second quarter, sales were \$47.4 million, compared with 1986's second quarter volume of \$35.8 million, and losses declined from \$9.3 million to \$6.8 million.

Stockholders' equity as of June 30, using the LIFO method of inventory costing, declined further to a deficit of \$38.6 million.

## Employees Purchase Badger Northland, Inc.

Badger Northland, Inc., Kaukauna, Wis., has been bought by Badger employees and local investors from British Tire & Rubber, Inc. Kaukauna Investment, Inc., a group of 12 local investors and Badger officers, bought the firm June 30. As part of the buyout, employees will purchase stock in the company under an employee stock ownership plan.

Murray Thorndycraft continues as Badger's president. Kenneth Myers is executive vice president and treasurer.

The company manufactures forage, feed and manure handling equipment.